The Fall River Conflagration
May Aid the City Plan
(See Page 88)

MAR 9 1928

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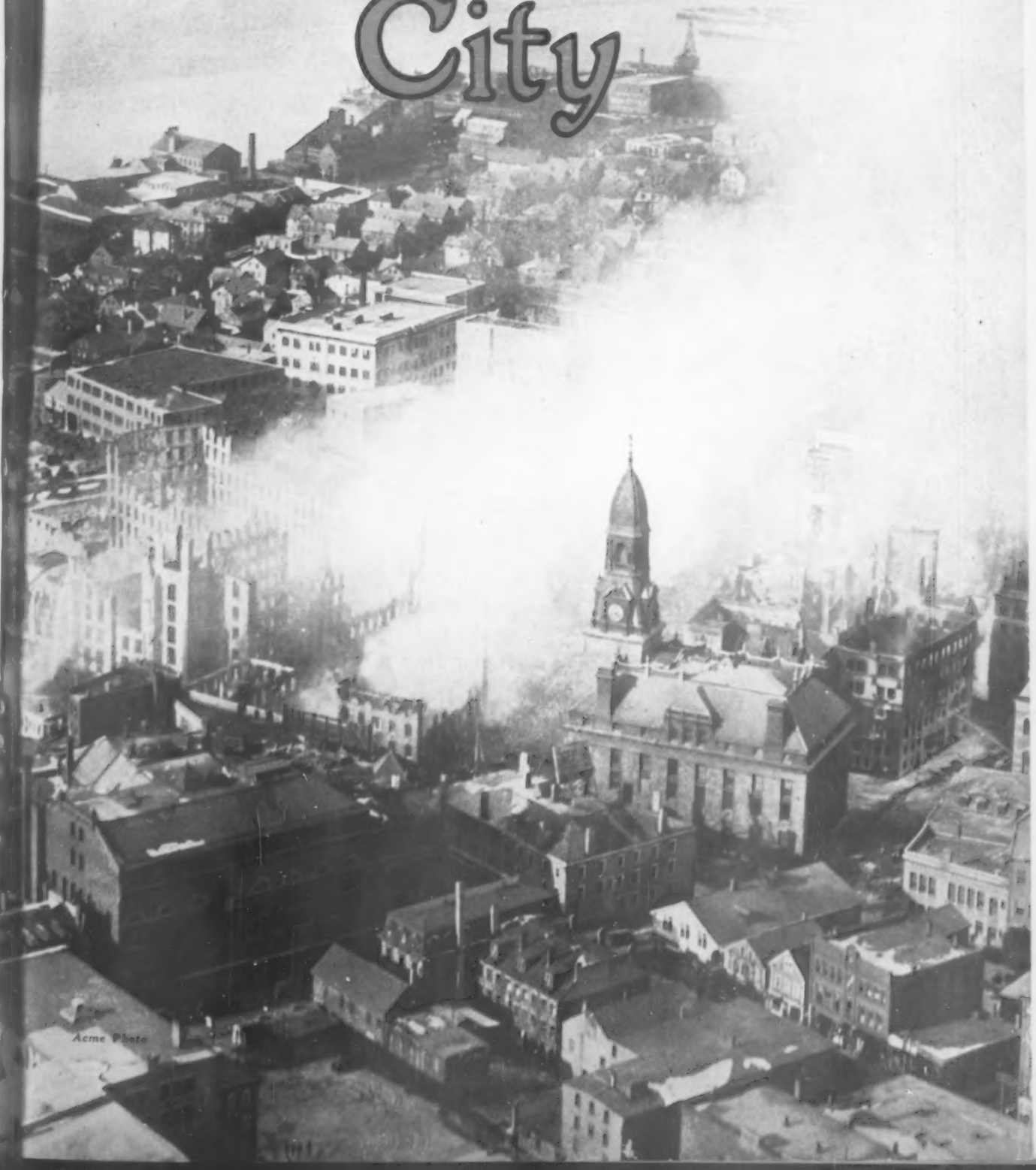

Acme Photo

Lindell Boulevard, St. Louis, Mo., Texaco Sheet Asphalt on old macadam. Laid 1927.

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Associate Editors

The American City

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EDGAR J. BUTTENHEIM
President and Manager

TOM DIX
Vice-President

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See page preceding back cover

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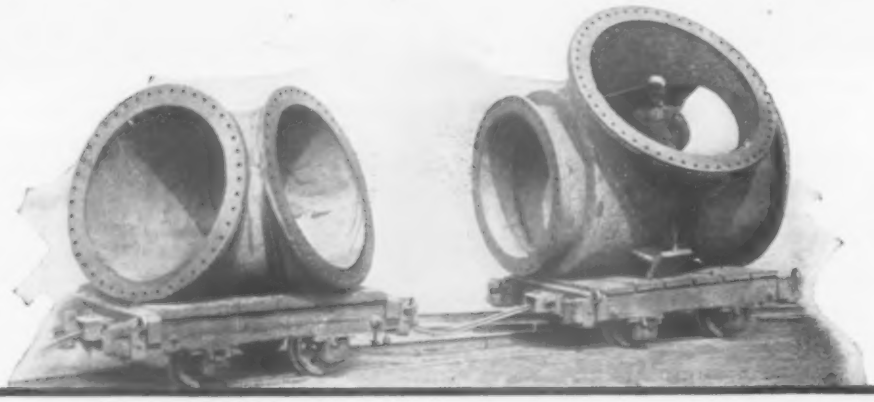

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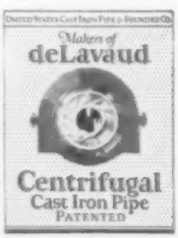

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Intelligent and Effective Control of Land Subdivision

is essential to the welfare of every growing city having undeveloped acreage. So few municipalities have yet adopted carefully drafted rules governing the subdivision of land, that THE AMERICAN CITY is glad to publish in full (on pages 127 to 130 of this issue) the excellent rules recently approved in Riverside, Calif. The explanatory notes printed in italic type throughout the rules will be found of especial interest to municipal officials and city planning commissions who have—or ought to have—the power to prevent short-sighted exploitation of urban land by ignorant or unscrupulous developers.

Items and Abstracts for MAYORS AND CITY MANAGERS

Rapid Transit Suggested as a Partial Solution of the Parking Problem

IN his annual report as President of the City Planning Commission of Seattle, Wash., submitted January 10, 1928, E. S. Goodwin points out the fact that, in common with all cities, Seattle has the problem of auto parking and storage, most acute in the downtown business district. Rapid transit is suggested as a partial solution:

"Down-town storage garages are not profitable unless operated at prices which the masses of car owners are unwilling to pay, and it is exceedingly difficult to permit such parking as will be satisfactory to merchants and shoppers, and at the same time prevent the use of our streets as open-air garages for those who use their cars only for transit to and from their homes. Apparently the only solution is by way of a rapid-transit or greatly improved and speeded street-railway system, which will give satisfactory service in competition with the private car owner. Obviously the existing street-railway system must have very substantial assistance and this aid should be supplied only after most thorough study by experienced men. The Rapid Transit Committee of the City Planning Commission has accumulated a great amount of data bearing on this subject and has evolved a plan which has been transmitted to the City Council with recommendation for study by qualified experts."

If Your City Has Alleys, Are They Being Used to the Maximum for Traffic Relief?

THIS question was raised in an address by Gustave C. Schink, Director of Traffic of the Detroit Police Department, before the recent Michigan Highway Transportation Conference, at Ann Arbor. To quote in part:

"Alleys should be used more extensively, and the loading and unloading at street curbs should be avoided to as great an extent as possible. After completing the alley survey, our engineers reported the following unfavorable conditions:

"1. The absence of street numbers—and in most cases of firm names—on alley entrances of business houses, served to deter freight from being delivered via alleys. Certain business houses declared they did not use their alleys because of the inconvenience in connection therewith.

"2. In many alleys private automobiles were parked and thus interfered with alley use by freight-carrying vehicles.

"3. In some of the alleys piles of ashes and rubbish impeded vehicular movements and some alleys were blocked by building construction material.

"4. In a few instances the alleys were congested by freight-carrying trucks. This condition could be largely remedied by cooperative arrangements.

"5. In some instances buildings abutting upon alleys had no alley access.

"6. Some business houses used the streets for freight handling because their elevators are located adjacent to streets.

"Business men should cooperate to eliminate these unfortunate conditions and promote the possibility of having much of this trucking, freight hauling and other commercial work, done at night time when the heavy, cumbersome vehicles would have clear streets and an almost uninterrupted right-of-way."

"Has Prohibition Promoted Public Health?"

THIS question is taken up and examined in its various aspects by Dr. Haven Emerson, Fellow, A.P.H.A., Professor of Public Health Administration, College of Physicians and Surgeons, Columbia University, in an article in the December, 1927, issue of the *American Journal of Public Health*. He notes the general unreliability of available data and their inadequacy as a basis for definite conclusions and comments on the need for a new technique in studying present information, before a positive answer can be given as to the actual effect upon the public health, of the Eighteenth Amendment and the Volstead Act.

Summarizing important factors of the problem, Dr. Emerson finds reason to believe that at least some of the general improvement in public health which has taken place must be attributable to the outlawed commerce in alcoholic beverages. With the moderation characteristic of the truly scientific-minded, however, he qualifies: "It may well be that this is merely the rationalization of convictions on the subject of the harmful effects of alcohol as I saw it used in moderation and excess in the course of fifteen years of practice." But, in conclusion, he reenforces his statement of opinion and urges renewed prohibition education on the part of health workers:

"It is impossible for me to escape the force of the many converging and corroborating facts which tend to show that the housing and living conditions of the wage-earners of this country have been much improved by the process of diverting the 5 to 10 per cent of their income which used to go regularly into liquor toward more valuable commodities such as shelter, food, clothing, and wholesome recreation.

"I conceive the evidence sufficiently impressive, even though far from complete or accurate in the scientific sense, to justify health officers and health workers of all kinds to use all the power of education to reduce to the minimum the use of beverage alcohol in their communities, and may I suggest that example is a forceful way of teaching and worth more than millions of words."*

*The January issue of the *American Journal of Public Health* contains a valuable presentation of the statistical phase of this subject, by Louis I. Dublin, well-known statistician of the Metropolitan Life Insurance Co.

Home Rule Charter Cities in Ohio

IN Ohio there are now 93 cities (municipalities over 5,000) and 729 incorporated villages (municipalities under 5,000). Only twenty-two of those cities and four of the villages, according to the records of the Secretary of State, have taken advantage of the right to frame and adopt their own charters. The others are operating under the charters provided in the general code. The home-rule cities and villages which have adopted their own forms of government, as listed in the January 11 issue of *Greater Cleveland*, are:

Cities	Form	How Framed	Adopted
Akron	City-Mgr.	Charter com.	1919
Ashland	Council-Mayor	"	1914
Ashtabula	City-Mgr.	"	1914
Cincinnati	Council-Mayor	"	1917
	City-Mgr.	Amendment	1923
Cleveland	Council-Mayor	Charter com.	1913
	City-Mgr.	Amendment	1921
Cle. Heights	City-Mgr.	Charter com.	1921
Columbus	Council-Mayor	"	1914
Dayton	City-Mgr.	"	1913
E. Cleveland	City-Mgr.	"	1917
Gallipolis	City-Mgr.	"	1917
Hamilton	City-Mgr.	"	1926
Lakewood	Council-Mayor	"	1917
Lima	City-Mgr.	"	1920
Middletown	City-Mgr.	"	1913
Painesville	City-Mgr.	"	1925
Sandusky	City-Mgr.	"	1914
Shelby	Council-Mayor	"	1921
Springfield	City-Mgr.	"	1913
Toledo	*Council-Mayor	"	1914
Xenia	City-Mgr.	"	1917
Youngstown	Council-Mayor	"	1923
Zanesville	Council-Mayor	"	1915
	VILLAGES		
Cuya. Heights	Council-Mayor	General code	1920
S. Charleston	City-Mgr.	Charter com.	1917
Up. Arlington	City-Mgr.	"	1924
Westerville	City-Mgr.	"	1916

* Now framing a city manager charter.

More Evidence Needed

IF, as the religious questionnaire revealed, this country is 91 per cent Christian, what we can't understand is why the sidewalks are not cleaned off more generally when it snows.

—*Ohio State Journal.*

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Items and Abstracts for ENGINEERING AND HIGHWAY DEPARTMENTS

Amount of Gravel Used on Roads

THE Washtenaw County Road Commission, Michigan, recently completed a study of the amount of gravel used on various roads in Washtenaw during the last five years. The total number of cubic yards used each year has been divided by the length of the road, and the average number of cubic yards per mile obtained. Fourteen roads with a total of 89.4 miles were included. If the totals are averaged, it gives 155 cubic yards of gravel per mile for the 14 highways. This figure, however, does not take into consideration the amount of traffic using the individual roads.

Snow Blockades Cost Ten Billion Dollars Annually

ONE authority has set the annual cost of snow blockades in the vast northern territory which includes nearly one-third the area of the United States and practically all of Canada at ten billions of dollars. This includes, in addition to damaged road surfaces and losses on highway investments, interest charges on millions of idle motor vehicles, winter depression in the oil, automobile supply and related industries, increased cost and decreased revenue in nearly all lines of business, added fire hazards, delays in mail delivery, ravages in health because of the inability of the doctor to make his rounds, interference with education, commerce and travel, and untold inconvenience to the public in all walks of life. An article in this issue of THE AMERICAN CITY gives the opinion of a considerable group of authorities on the costs of snow blockades.

Maintaining Collection Schedules

WHEN a town grows from 9,200 inhabitants in 1920 to 35,300 in 1927, one would expect a tremendous expansion in the personnel for its garbage and refuse collection. In Orlando, Fla., however, Carroll Carlson states in his article in this issue, while the refuse collection did not keep pace with the rapid growth in population, the fault was not with the number of collectors in the department, but rather in the routing and organization. Better scheduling and the use of "shuttle" drivers have made it possible to collect the garbage of the city with 8 trucks, 8 truck drivers and 15 loaders, where previously the work had been done by 9 trucks and drivers and 27 men. Close studies of the situation have led the city to begin the installation of a side-dump trailer collection system to supplant the truck collection.

Rubber Block Paving

MUCH time, money and research have been expended upon the problem of the adaptation of rubber to the surfacing of special streets. In the limited trials which have taken place with this material over the last twenty-five years, according to the *Municipal Journal and Public Works Engineer*, London, England, some remarkable results have been obtained in the life value which it is proved to have. Its resilience, silence and absence of wear and attrition are alike remarkable, but there has been one mechanical problem on which most of the past efforts have broken down. This has been the difficulty of anchoring the armoring or wearing coat down to the road foundation, and it has proved a much more difficult problem than was at first surmised.

Numerous patents and devices have been tried out and abandoned. It has only lately come to be realized how great are the horizontal shear stresses set up by modern heavy traffic units. The matter of joints between block and block has also been a source of distress. There are indications, however, that at least one good example is now available that has overcome the question of anchorage and after twelve months' use in full service, carrying 60,000 tons per day, shows no sign of distress or even of wear. If the promise of its first year of service is maintained, it will be difficult to forecast the total life value of this class of material.

The initial cost of construction, therefore, though heavy, may in time be completely justified by the increased immunity from repaving and reconstruction. Incidentally, while there is a slight diminution of road noise through the use of rubber pavement, what remains in the shape of mechanical noises from motor vehicles is still alarmingly high. One of the chief advantages which was disclosed was a reduction in the vibration transmitted to adjoining buildings. This is a factor of increasing importance and would also go far to justify a most interesting development in the road surfacing treatment of dense cities.

An Argument Against Snow Removal

ACCORDING to a report received from the Minnesota State Highway Department, snow plowing has many thrills. One of the Minnesota district maintenance superintendents in western Minnesota reported that one of his snow-plowing crews approached a village situated between two larger towns and was met by a crowd of about 150 business men and other residents of the village who bombarded the snow-plowers with snowballs until they were forced to turn around. The excuse given was that if the road were opened, some of the trade would go to the larger towns nearby.

These people apparently forgot that all roads run two ways and that with proper advertising and proper merchandising methods, it is possible to bring trade into a town many times greater than the trade which may go out of town. Many small-town merchants who know how to attract trade have greatly increased their business since automobiles and good roads became general.

Fine Crushed Rock and Gravel Surfaces

AS commonly constructed, the fine crushed rock and gravel surfaces of traffic-bound metaled roads are built in two courses to a total thickness of about 6 inches. The maximum size of the base stone is approximately 1½ inches, and that of the top course, 1 inch or ¾-inch. Crusher-run material is used for both courses—often with an admixture of clay or other binder—and both courses are compacted under traffic, the construction trucking being utilized as much as possible for this purpose.

Such surfaces are maintained by frequent blading or dragging or by a combination of the two. Ideally, there should be maintained on the surface of the road a light mulch, consisting of about half an inch of loose, fine material to protect the compacted metal beneath; and the constant working of this fine material across the surface has been found effective as a means of preventing the formation of pits and corrugations.

Intended for light traffic, and serving best where the traffic does not exceed 300 vehicles per day, these roads can usually be kept smooth at a yearly cost of about $1 per mile for each unit of average daily traffic. For example, a road carrying an average traffic of 300 vehicles per day can be kept smooth at a cost of about $300 per mile per year.

This, however, does not include the cost of replacing the material worn from the surface by the traffic, a loss which is very considerable, and which, with the accompanying dust nuisance, is perhaps the most serious objection to the types. Estimating from the interval between resurfacing operations and the amount of metal added, reports received indicate that from 1 to 1½ inches of metal will be removed in a year by a traffic of 500 vehicles a day. It is possible that these are extreme cases, and that the heavy loss indicated is the result of imperfect compacting or the use of inferior material; but even if the estimates be heavily discounted, and the loss be assumed to average no more than ¾-inch of compacted material a year, the annual cost of replacement, at $2.50 per cubic yard, loose measurement, will be $750 a mile of 18-foot surface. Adding to this the $500 per mile required for ordinary maintenance, the total annual cost of upkeep for an 18-foot roadway, carrying 500 vehicles a day, is found to be no less than $1,250 a mile; and this is a conservative figure.

The other objections that have been raised against the type are (1) that the tractive resistance of the surface is high, and (2) that it causes heavy tire wear.

Gravity Water Supply Provides Sure Fire Protection

MILLIONS of dollars' worth of property in small cities is protected by volunteer fire companies with equipment that is sometimes not as modern as they could wish.

In many cases it is impossible to provide better fire-fighting equipment. But at least the water supply can be assured by adequate storage in a Horton elevated tank. Even though handicapped by inadequate equipment, a fire department can do effective work if the water is available in ample quantity and and at ample pressure while the best equipped department is powerless without water.

A Horton Tank is within easy reach of almost any community that wants a public water supply system. The tank ordinarily produces economies in operation as well as in cost of the distribution system which more than justify its cost.

Our engineers will gladly discuss the application of elevated tanks to water systems with any interested city officials. Address the nearest sales office.

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San Francisco.....1033 Rialto Bldg.

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Algae Not Harmful to the Health of Water Drinkers

OTHER than the possibility that unpalatable, though sanitary, domestic water-supplies may cause people to seek more palatable, but less sanitary, sources and hence cause illness, algae which produce tastes and odors in drinking-water are not harmful to the health of consumers. The methods for eliminating tastes and odors caused by algae in water include the use of chlorine and copper sulphate. Copper sulphate is probably best adapted to the eradication of algae in reservoirs, while chlorine is an excellent means of overcoming odors caused by algae. Endeavors should be made to eradicate algae in reservoirs rather than to destroy them when they reach the final purification process.

Iron and Manganese Removal at Wausau, Wis.

ONE of the most insidious chemicals which it is necessary to remove from water is manganese. When combined with iron, it will sail right through the filtration plant unless proper aeration and other pre-treatment is provided. The plant at Wausau, Wis., designed by W. G. Kirchoffer, of Madison, Wis., is an interesting example of how a plant can be built to remove manganese and iron with a minimum cost of operation. The article by Emil Flatter, Superintendent of Water-Works at Wausau, Wis., in this issue of THE AMERICAN CITY, describes the operation of the plant as well as giving details of its construction.

Sewer Rentals to Pay Operating Costs of New Treatment Plant

DELAWARE, OHIO, a city of about 10,000, has taken advantage of the Ohio sewer rental law enacted in 1922 and will make charges against all sewer connections to secure an annual rental of about $11,000, to provide not only for the maintenance and operation of its new sewage treatment works, but also for the maintenance of the sewerage system and the cost of clerical work required by the collecting agency. The average charge per dwelling connected will amount to about $4 per year. In this issue of THE AMERICAN CITY will be found an article describing the features of the new sewage treatment works at Delaware, including the methods of financing the improvement through the sale of 10-year 5 per cent bonds, a complete description of the Imhoff tank-sprinkling filter plant, pumping equipment, preliminary treating, treatment by bar gratings, and reasons for the elimination of the grit chambers, secondary treatment by trickling filters, how the problem of sludge disposal was solved, and then a table of costs. Another interesting feature of the design of this plant is the fact that the pumps were placed ahead of the settling tanks, permitting gravity flow throughout the plant. This allowed minimum rock excavation in the construction of the settling tanks and afforded a means for protecting all of the structures from flooding. Another novel feature is the use of a one-foot layer of crushed granite on top of the trickling filters, as limestones and slags are more liable to disintegrate through the alternate freezing and thawing action to which the top layer of filtering material is subjected.

Items and Abstracts on WATER AND SEWERAGE

Control of Algae Growth in Impounding Reservoir

THE water-supply at Bucyrus, Ohio, is obtained from two small impounding reservoirs. It is treated in a modern rapid sand filtration plant. The reservoirs have a maximum depth during the summer and fall of 10 feet and 14 feet, respectively. The bottoms and banks of each are mud. The turbidity of the water during dry weather is low and the shallowness and character of the bottom and banks are favorable for the growth of algae.

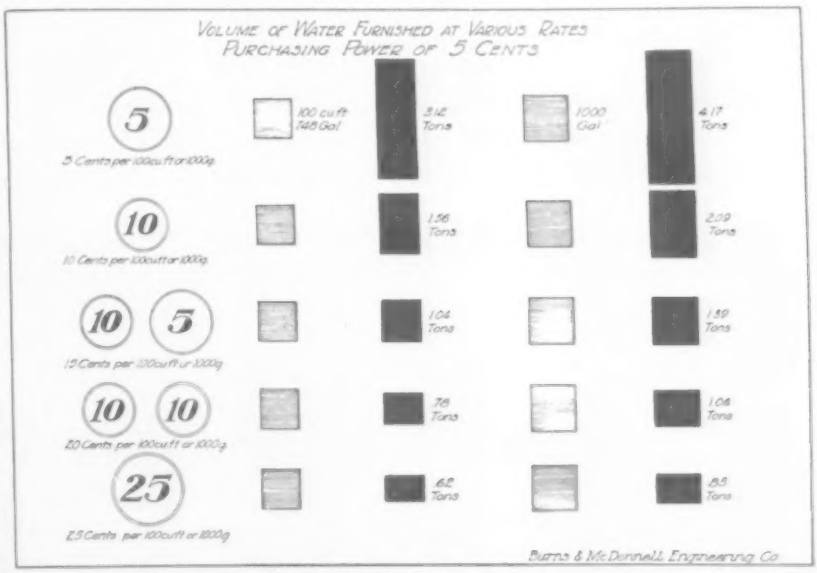
Prior to 1925 trouble had been experienced with algae, resulting in short filter runs and disagreeable tastes in the water distributed to consumers, according to a paper read by A. B. Cameron at the Sixth Annual Ohio Conference on Water Purification. Irregular use had been made of copper sulphate as an algaecide. In the early spring of 1925 the regular treatment of the reservoirs with copper sulphate was started. The rate of application varied 0.25 to 0.40 p.p.m. applied once in May, twice in June, in July and in August, and once in September. As a result, no disagreeable tastes were noted in the water during the summer, and filter runs averaged 23 hours. From 2 to 2.5 per cent wash water was used. The cost of treatment amounted to $1 per million gallons of water delivered to the city.

In 1926, similar treatment was begun in the spring. Treatment of the reservoirs was undertaken as soon as any decrease was noted in the filter run. Microscopic examinations were also made daily. The presence of littoral growth at the filter plant was also an indicator of the proper time to treat the water. On one occasion the copper sulphate treatment was followed by a disagreeable taste in the water from one of the reservoirs.

It is concluded (1) that the systematic treatment of impounding reservoirs is inexpensive and, from the operating and esthetic point of view, well worth while; (2) that copper sulphate in quantities of 0.25 to 0.40 p.p.m. applied at proper intervals will sufficiently control algae growth; (3) that microscopic examinations are desirable but have not proved to be necessary; (4) that treatment should be often enough to keep well ahead of the growth so that unpleasant tastes and odors will not be produced as an after effect of the treatment.

Who Owns the Water Meters in Your Town?

A STUDY of the reports of 3,282 cities showing the ownership of meters in those cities indicates that in 1,764 cities the meters are owned by the municipal water department. In 682 they are owned by the private company, and in 836 instances are owned by the consumer. Totaling the number of cities reporting ownership by the municipal department or the private company, it is found that in 74.4 per cent of the cities, ownership is by the purveyor of water, rather than by the consumer. The opinions of consulting engineers published in this issue of THE AMERICAN CITY indicate that ownership should be in the hands of the purveyor of water.



AN INSTRUCTIVE CHART SHOWING THE VOLUME AND WEIGHT OF WATER WHICH CAN BE PURCHASED AT VARIOUS METER RATES

LAYNE WELL SYSTEMS

CONTRIBUTE TO

CIVIC BEAUTY

COMPLETE SINGLE UNIT REQUIRING NO AUXILIARIES
DIRECT-CONNECTED ELECTRIC MOTOR OPERATION
SIMPLE, COMPLETE, AUTOMATIC CONTROL

REQUIRES SMALL FLOOR SPACE WHICH PERMITS A BUILDING COMBINING NEATNESS, COMPACTNESS AND BEAUTY, AROUND WHICH AN ATTRACTIVE ARRAY OF SHRUBS AND FLOWERS MAY BE MAINTAINED TO ADD TO ITS CHARM

Cities are taking more interest in Civic Pride than ever before They must offer more than their natural industrial resources. It has become necessary to make the Civic Beauty of a town attractive.

Use Layne Wells. Make each one a thing of beauty to stand as a monument to Civic Pride.

LAYNE BOWLER

MEMPHIS INC. TENNESSEE

WHO'S WHO IN WATER SUPPLY

Installment No. 3—For Previous Installments see January and February Issues.

STEPHEN H. TAYLOR
Supt., Water Department,
New Bedford, Mass.
(Appointed 1919)

HORACE KINGMAN
Supt., Water Department,
Brockton, Mass.
(Appointed 1893)

PATRICK GEAR
Supt., Water Department,
Holyoke, Mass.
(Appointed 1913)

BRENTON W. VAUGHAN
Supt., Water Department,
Everett, Mass.
(Appointed 1917)

DAVID A. HEFFERNAN
Supt., Water Department,
Milton, Mass.
(Appointed 1902)

MICHAEL J. MAHONEY
Supt., Water Department,
Easthampton, Mass.
(Appointed 1916)

ALBERT A. ROSS
Supt., Water & Sewer Department,
Lexington, Mass.
(Appointed 1923)

A. C. REMLEY
Sec., Appleton Water Commission, Appleton, Wis.
(Appointed 1920)

EMIL FLATTER
Supt. of Water-Works,
Wausau, Wis.
(Appointed 1926)

C. P. GROSS
Supt. and Manager of Public Works, Wisconsin Rapids, Wis.
(Appointed 1921)

LEE CORBIN
Supt. of Water-Works,
Barnesville, Ohio
(Appointed 1917)

W. S. WATSON
Com., City Water and Light Department, Hastings, Nebr.
(Appointed 1915)

W. E. VEST
Supt., Water-Works,
Charlotte, N. C.
(Appointed 1910)

GEO. REYER
Supt., Water-Works,
Nashville, Tenn.
(Appointed 1882)

in { a large park / a large school / a large residence / a large tenement / a large home / a large camp / a large city } *or a small one*

Any place-large or small-
where people gather or live-

PLAYGROUND **EverWear** APPARATUS
(STANDARD SIZE AND STANDARD FOR QUALITY SINCE 1907)

&

PLAYGROUND **EverWear Junior** APPARATUS
(SMALL IN SIZE. A NEW 1928 LINE OF EVERWEAR EQUIPMENT)

Write for Catalog No. 20 or No. 20-A, the latter for "Junior" outfits

The Everwear Manufacturing Co.
SPRINGFIELD OHIO

Do you mention THE AMERICAN CITY when writing? Please do.

Items and Abstracts for PARK AND PLAYGROUND DEPARTMENTS

The Right Kind of Recreation a Preventive of the Wrong Kind of Citizenship

THAT juvenile delinquency could be cut seventy-five per cent and health and good citizenship could be vastly improved in any community which would provide itself with the right kind of recreation facilities and leadership, is the belief of Dr. John A. Lapp of Chicago, Director of the Department of Social Action, National Catholic Welfare Council, as expressed in an address at the last Recreation Congress of the Playground and Recreation Association of America.

"Recreation teaches honesty," said Dr. Lapp, "True sport is an honest affair, and youth who are trained in the ideals of sport ought to be better citizens and understand civic rights and duties. Not only are sports honest, but the public would not tolerate them otherwise. If the public began to doubt the honesty of baseball, the support of the game would immediately drop away.

"If the public should ever reach a point where it would insist upon public honesty to the same degree that it now insists upon honesty in sports, we should have a pure and undefiled government. Why do we have so many youthful criminals? Why is it that we find them originating in certain sections of our cities? The answer is that we have left youth in our congested centers to the evils of their surroundings and the influence of bad companionship. We have never opened the door to richer recreational activities, and have left youth to their own devices in the streets.

"The fact that games, athletics and outdoor life build muscles and keep the body fit is well recognized. Their benefit to the mind and spirit the public has yet clearly to appreciate. Energy, mentality, earning power, mortality and citizenship in both children and adults are immensely stimulated by recreation. If it is only in the field of health, social justice demands that every community should have organized recreation. For fifty per cent of the new recruits to poverty come to their dire need on account of sickness. Millions are held close to the poverty line by physical weakness and incapacity. For these, recreation, property organized in their youth, would have been an inestimable boon."

What Does Your City Provide for Its Boys to Do?

THE chief places of recreation for the youth of Newark, N. J., are the street and the moving-picture "palaces," according to a report recently made public by Boys' Work Committee of the Newark Rotary Club. The report bases its information, chiefly, upon questionnaires filled in by 26,557 boys ranging in age from 8 to 17 years.

Analyses of the data contained in these questionnaires show that two out of every three boys reporting attend the movies once or twice a week, and that two out of every three spend their leisure time on the streets.

The committee spent a year investigating the conditions reported upon, with the cooperation of other welfare and civic agencies of the city. The questionnaires were filled in under classroom conditions in public and parochial schools, and in order to encourage the greatest frankness in replies to questions asked, they were permitted to omit their names.

Replies show that 14,126 boys attend the "movies" once a week; 1,823 reported attendance at least twice a week; and 5,188 two or three times a month. A study made by the committee of one week's showing in 37 Newark picture houses revealed the mental and spiritual food provided as consisting of 27 emotional films, seven adventure stories, and three comedies. The emotional stories were reported as "nearly all concerned with the problems of adult life," and dealing with love, sex, society, night life and similar themes.

It was, perhaps, impossible for the committee to similarly analyze the attractions and influences afforded by the street as a loitering-place. The report, however, shows that only one out of every five boys reporting belongs to or comes under the influence of organizations working in the boy-life field; and that one out of every nine is a member of some self-organized small group, or "gang"!

More playgrounds are urgently recommended as one of the ways of meeting what is designated as "a problem of civic importance rating with that of education as imparted by the public schools under state mandate." The committee puts forward suggestions for the organization of a non-partisan, non-sectarian body made up of "organizations working in the boy-life field" to bring about the extension and coordination of present facilities for the increase of boys' recreational and social guidance.

Democratic Cats—Costumes Out of Mothballs—and Dramatized Swimming

AMONG highlight social items of the midwinter season in the world of play, as reported by *The Playground* (magazine of the Playground and Recreation Association of America), were an Alley Cat Show, in Baltimore; a "Tacky Party" in Memphis; and a winter water pageant in Dalton, Mass.

The chief entrance qualification for the cat show is reported to have been that Tom should have no pedigree! And the only other essential was that he must be clean. Three classifications were open: solid-colored cats; tabbies, which, technically, are cats with spotted or striped fur; and cats of any color mixed with white. This bench event was held under joint auspices of the Playground Athletic League and the Baltimore *Evening Sun*, the latter presenting a cup for the best example of an alley cat in the whole show, and a similar cup of somewhat smaller size, for the worst cat.

The Glenview Community House, in Memphis, was the scene of the typically Southern, mirth-provoking, celebration of olden times of which the chief feature was the "tacky" costumes, many of which had not been out of mothballs since long-past wedding celebrations.

One of the winter features of the community house natatorium at Dalton, Mass., was equally novel in character, being a water pageant, "How Swimming Grew Up." Approximately 300 people saw the two performances given.

More and Better Swimming in Toledo

ONE hundred forty-nine thousand children bathers visited the public pools of Toledo, Ohio, during the season of 1927, according to a report of the Commissioner of Recreation made public in the *Toledo City Journal*, February 11, 1928. Attendance showed an increase of 45 per cent over 1926, a fact attributed by the official to the greatly improved sanitary conditions and housing. Important among the improvements, seven new bath-houses are reported, each with modern conveniences and equipment including showers, drinking-fountains, lighting and toilets.

For safeguarding children against physical dangers, two swimming instructors were provided to teach beginners; and daily tests of the water in the pools were made by the Department of Health and supplemented by frequent tests of the general sanitary conditions surrounding pools.

That All May Play

"GUILDS of Play" are a means adopted by the City Playground and Park Departments of Columbia, S. C., for taking playground attractions to children who live remote from playground centers. "Guilds of Play" were organized last summer by play leaders who went into four different sections of the city and started games and other recreational activities on vacant lots. Officials responsible for the programs report a gratifying response on the part of the communities and a keen interest on the part of the children.

Of Special Interest to Park and Playground Departments

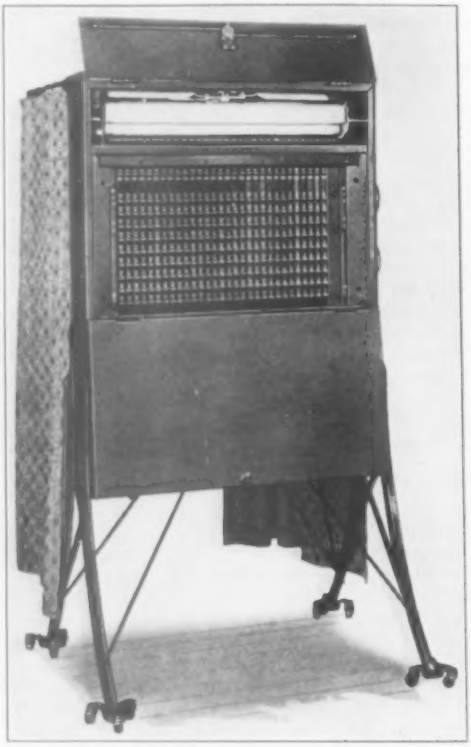
are the articles

on pages 93, 98, 113, 127, 137, 139, 159 and 161

of this issue

Avoid Costly Election Contests Once and for All

By Using Voting Machines



Back of voting machine, showing counter compartment where total vote is recorded. This compartment is locked and sealed after election and a recount involves only reopening and checking the figures.

"ON November 18, a recount was held in the City of Buffalo for the office of District Councilman, Lovejoy District. Thirty voting machines were opened and new tally made, which agreed exactly with the original returns filed by the inspectors of elections. Recount was completed within 25 minutes."*

Election contests and recounts, dissipating the taxpayers' money and using up valuable time of election officials and courts, are quickly disposed of when the voting machine is employed. The figures, mechanically tabulated with comptometer accuracy, cannot be wrong. It is a matter of minutes, instead of hours or days, to conduct a recount with the modern mechanical ballot. And the tally cannot be questioned.

If your community is not yet using voting machines at all elections, you owe it to the voters to investigate their accuracy, economy and other advantages.

*From a report of the Commissioners of Elections for Erie County (Buffalo), New York

AUTOMATIC REGISTERING MACHINE CO., Inc.

JAMESTOWN NEW YORK

SEND TODAY FOR ILLUSTRATED, DESCRIPTIVE PAMPHLETS

Does Your State Need Aviation Legislation?

THE 1928 municipal legislative program, presented to the Governor and the Legislature of New York by the officers and the advisory committee of the New York State Conference of Mayors and Other Municipal Officials in behalf of the cities and first-class villages of the state, includes the following recommendations concerning airports and aviation:

"We urge the Legislature to give to municipalities power to issue bonds and appropriate funds for the construction and equipment of airports, landing fields and emergency fields and to appropriate funds for the maintenance and operation of such aviation facilities.

"We urge the Legislature to give to municipalities power to purchase, lease or condemn land within or without their limits for airports, landing fields and emergency fields.

"We urge the enactment of a law to provide for state control and regulation of aviation in harmony with and complementary to Federal air laws.

"We urge the Legislature to create a joint legislative committee to consider further the state's airway policy."

Centralized Purchasing as a Safeguard Against Graft

THAT the present sewer scandal in the borough of Queens, New York City, has demonstrated, better than any previous example, the need for centralized purchasing, was suggested by Russell Forbes, Director, Municipal Administration Service, in a radio talk on "The City as a Buyer," over WOR, on January 31. "Newspaper reports," said Mr. Forbes, "have shown that the several boroughs paid various prices ranging from the established market price to ten times that amount for the same kind and quality of sewer pipe at the same time and from the same supplier. With purchasing centralized in one office, the city would have paid one price for all sewer pipe of the same quality, and probably at a lower unit cost than the regular price quoted to small consumers. The saving to the taxpayers would have been enormous. Such conditions would not long be tolerated in private business. Should they be tolerated in our public business?

"New York City has taken several steps in the direction of centralized purchasing, but is still far from that goal. Mayor Mitchell appointed in 1914 a centralized purchasing committee headed by Henry Bruere, then City Chamberlain. That body, although lacking legal sanction and given only lukewarm support from department heads, functioned with marked success until 1919. In that year Mayor Hylan was authorized by state law to appoint a Board of Purchase, which continued until the creation in 1923 of the present Department of Purchase.

"Since the establishment of the Department of Purchase, it is commonly believed that the city has adopted the centralized plan of buying. Such is by no means the case. The Department of Purchase has authority to buy only for those departments whose heads are appointed by the mayor. Although the Department of Purchase is the largest buying agency, less than two-fifths of the total volume of supply expenditures clear through that office.

"With the tax rate on the verge of the constitutional tax limit, and with the needs of the city constantly increasing, New York City cannot afford much longer to continue its present hit-or-miss system of spending fifty millions per year for the commodities necessary to the public service."

Items and Abstracts for FINANCE AND LEGAL DEPARTMENTS

Articles of Special Interest

to finance and legal departments appearing in this issue include:

"A Proposal to Zone the Lands Along the State Highways of Massachusetts"—p. 159.

"Rules for Land Subdivision"—p. 127.

"The Audit of a City's Books"—p. 153.

"Comparing Split-Rate Bids on Municipal Bond Issues"—p. 155.

"Are Your Citizens Getting a Square Deal in Assessments for Taxation?"—p. 163.

"Legal Decisions"—pp. 157, 159.

"Urgent Need of Greater Efficiency in Criminal Identification"—p. 116.

The Municipal Bond Market

By SANDERS SHANKS, JR.
EDITOR, *The Bond Buyer*

FOR the past seven years state and municipal borrowing has exceeded $1,000,000,000, and in two of those years (1924 and 1927) it exceeded $1,400,000,000. For at least three years, those closest to the subject of municipal financing have been predicting a reduction in the volume of such borrowing, but have so far been wrong. The opening weeks of the current year, however, suggest that the expected reduction in borrowing for permanent public improvements is at hand. The January total of new issues was just under $100,000,000, as against $174,675,400 in January, 1927. February has also been an unusually quiet month. On the other hand, the outlook for a larger supply of new bonds is improving rapidly. The aggregate of bonds actually scheduled for sale for thirty days ahead is, as this is written, in keeping with the active months of last year.

While it is difficult to get together statistical data which would support a definite conclusion with respect to the future volume of state and municipal borrowing, it is the writer's opinion that the average annual total of new issues for the past seven years may be considered a normal figure from which borrowings during the next five or ten years will fluctuate. This view is based largely upon the belief that the cities throughout the country must borrow in ever increasing amounts if they are to keep in step with their population and territorial growth and with the insistent demands of their citizens for better transportation and traffic facilities, additional water-supply and fire protection, the utmost in the way of sanitation and other health safeguards, more generous park and playground facilities, and last, but not least, the finest educational plant money can buy. The states and counties must continue to build hard-surfaced roads. The problem of financing highway construction has been greatly simplified by the development of a comparatively new and most important source of revenue, namely, the gasoline tax. Funds derived from this source offer a satisfactory basis for untold millions of state or county roads bonds.

The municipal bond market, after climbing to a relatively high price level, has shown a very slight tendency to soften in recent weeks, a natural response to the not seriously regarded threat of less easy money-market conditions. It may be stated that dealers specializing in municipals continue to show the keenest interest in all new offerings. The following table of representative issues indicates the present general trend of the municipal bond market:

Amount	Issue	Rate (%)	Maturity	Net Yield (%)
$600,000	Memphis, Tenn., Sch. Dist.	4¼	8 Mos.	3.50
84,000	Everett, Mass.	3¾	14½ Yr. Avg.	3.57
3,457,000	Allegheny Co., Pa.	4	15½ Yr. Avg., 15 5/6 Yr. Avg.	3.76
10,800	Fountain Co., Ind.	4½	6 Yr. Av.	3.77
1,000,000	Louisville, Ky.	4	37 Yr.	3.77
4,000,000	California	4	13 2/3	3.90
60,000	Ambler, Pa., Sch. Dist.	4¼	17½ Yr. Avg.	3.93
600,000	Omaha, Nebr.	4	20 Yr.	3.96
339,000	Portland, Ore.	4½	16½ Yr. Avg.	4.02
825,000	Richmond, Va.	4⅛	16½ Yr. Avg.	4.04
100,000	Southampton, N. Y.	5	1-10 Yr. Ser.	4.10
36,000	Swift Co., Minn.	4¼	10 Yr.	4.11
600,000	Montgomery, Ala.	4½	18 Yr. Avg.	4.26
1,000,000	Los Angeles Co., Sch. Dist.	5	19½ Yr. Avg.	4.25
20,000	Otsego, Mich.	4½	1-10 Yr. Ser.	4.26
260,000	Royal Oak, Mich.	4½	5 2/3 Yr. Avg.	4.31
400,000	Clearwater, Fla.	5½	10 Yr.	5.47

Air Undefiled—

Away on the lonely peaks the air blows sweet and pure. There in the solitudes, untouched by man, the sky above the forest is crystal clear. The breeze is undefiled.

So should it be in our cities and our towns! Pure air is a universal need. It is a birthright of which no citizen need be despoiled by reason of offensive waste disposal.

A Bartlett-Snow Sterling Destructor destroys garbage and refuse by fire. From its stacks rise only the clear, sterile products of perfect combustion. The city's air is left untainted; for the Mutual-cell Furnaces, about which Sterling Destructors are built, consume every acrid vapor.

Our Sterling Destructor booklet treats the subject at length. Write for a copy.

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Items and Abstracts for CIVIC AND COMMERCIAL ORGANIZATIONS

Engineering and Architectural Skill Alone Cannot Guide Healthy City Growth

THE modern city is so complex that it cannot be planned simply by the application of engineering, architectural, landscape architectural and other professional principles of design and adornment. Many of our modern communities are the victims of serious ailments which must be cured before they can grow in a healthy manner. This requires a diagnosis based on careful research which should be instituted by the professional city planners but may require the assistance of many other branches of endeavor. I would bring to your attention just two of such ailments:

1. The so-called "vicious circle" of rapid transit and congestion, new rapid transit and increased congestion and so on—ad infinitum. How can new lines be built where they should be located from city planning principles and not where the people demand them, which is bound to be through crowded areas and parallel to lines already congested?

2. The effect of rapidly increasing land values on the form and character of urban growth. How can we do away with blighted districts and false values created by excess speculation?

It is obvious that such problems cannot be solved without the aid of many groups of both professional and business men.

—From a discussion by Harold M. Lewis, Executive Engineer, Regional Plan of New York and Its Environs, before the January meeting of the City Planning Division of the American Society of Civil Engineers.

Attempting to Improve the Quality of Elective Officials by "Bawling at the Voter to Come Out and Vote"

THAT many campaigns for promoting better citizenship and raising governmental standards are accomplishing little because they rest on formulas which are both unscientific and ridiculous, was charged in picturesque language by Professor William Bennett Munro, of Harvard University, in his presidential address before the American Political Science Association, at Washington, D. C., December 28. Contrasting the wonderful progress of the physical sciences with the backwardness of political science, Dr. Munro made a strong plea for a more rational attitude towards the promotion of better citizenship than "has been afforded in recent years by expensive campaigns for improving the quality of our elective officials by the simple device of bawling at the voter to come out and vote."

The complete paper, "Physics and Politics—An Old Analogy Revised," is published in full in the February issue of The American Political Science Review. Quotation of its concluding sentences must suffice here:

"Political science should borrow by analogy from the new physics a determination to get rid of intellectual insincerities concerning the nature of sovereignty, the general will, natural rights, and the freedom of the individual, the consent of the governed, majority rule, home rule, the rule of public opinion, state rights, laissez-faire, checks and balances, the equality of men and nations, and a government of laws not of men.

"In place of these formulas it should seek to find concepts that will stand the test of actual operations, and upon these it should begin to rebuild itself by an intimate observation of the actualities. By analogy from the new physics, it should also turn part of its attention from the large-scale and visible mechanism of polities to the invisible and hitherto much-neglected forces by which the individual citizen is fundamentally actuated and controlled. More than a half-century ago the new biology suggested to us the abandonment of old ideas concerning the spontaneous creation of government; today the new physics may well suggest the discarding of our atomic theory of ultimate, equal, and sovereign citizens in a free state. It is doubtless true that the natural scientist, as such, can never guide us to the true purposes and policies which should direct human action in matters of government; but there is at least some hope that by paralleling his objectivity of attitude, and his process of operational study, the political scientist may reach that goal some day."

Wanted: Dollar-a-Year Men for Peace-Time Civic Service

"WHY should dollar-a-year men be limited to war services?" This question is asked by the *New York Evening Post* apropos of a suggestion by Mrs. Frances D. Pollak, Chairman of the New Buildings Committee, that the new Superintendent of School Buildings of New York City be given the help of an advisory "cabinet" composed of dollar-a-year men. These men, who would be architects, engineers and educators, with a layman or two, would give the superintendent the benefit of their knowledge and judgment.

"It is an excellent idea," says the *Post*, "with one reservation—it should not be limited to the position now vacant. There are many men of conspicuous ability who would not be willing to take public office but who would be more than ready to give a fraction of their time to the city or the state as advisers in matters concerning which they were qualified to speak. We have vast unused reservoirs of talent. The dollar-a-year arrangement is a practical method of tapping them. Let's do it."

Chicago Association of Commerce Promotes Highway Grade Separation

FOR the sketch reproduced on page 77 of this issue, and for the following description of the proposal, THE AMERICAN CITY is indebted to the Grade Separation Committee of the Chicago Association of Commerce:

"A proposed grade separation for two highways suitable for use in subdivided or built-up communities has been designed by the Cook County Highway Department. It has, in common with all such two-level crossings, the advantages of greatly increasing the traffic capacity of both main thoroughfares, of making crossing delays a thing of the past, and of reducing to a minimum intersection accidents.

"For the improvement, a right-of-way 120 feet wide is needed for at least a block each way from the grade separation corner.

"In addition to building the grade separation itself, it is proposed that the county pave the streets entirely around each of the four blocks of land affected by the two-level structure. These streets will form the right-hand loops that replace the left turns from one main thoroughfare to the other.

"The county also proposes to provide 24 feet of paved street space at grade for all property fronting on either of the main highways at or near the grade separation corner. These pavements provide for entrance to abutting buildings and for the right turn from one main highway to the other.

"Corner property on all eight of the intersections affected by the loops (a matter of 32 corners) is improved for business purposes. Furthermore, it is believed that both the widening and paving of the loops by the county, and the increased travel around the loops caused by the two-level crossing, will enhance the value of all property fronting on them.

"The county plans to build a structure on this plan during the present year and, together with the Grade Separation Committee of the Chicago Association of Commerce, is studying other methods and other important intersections with a view to extending the number of two-level crossings later."

Another important Chicago proposal for super-highways and grade separation is illustrated and described on pages 91 and 92. For a Harrisburg achievement on a smaller scale, see page 123.

"Civics by Radio"

THE promise held forth in announcements of a weekly program of "Civics by Radio" to be broadcast by the Citizens' League of Kansas City, Mo., over the *Kansas City Star* (WDAF) station, according to news accounts carried in a recent issue of the League's weekly bulletin, is being completely realized—and more than realized. The programs, it is stated, have been carefully planned, and some of the most prominent citizens have lent their cooperation. To ensure the greatest interest and value, speakers are required to prepare their talks in manuscript form and to confine them to fifteen minutes each. It was decided by those responsible that "the beneficial influence of this continent-wide educational publicity is invaluable."

The Esthetic and Economic Value of City Beautification

is receiving increasing attention from civic and commercial organizations. Articles in the present issue relating to various phases of this subject will be found on pages 98, 101, 106, 114, 120, 121, 127, 141, 143, 159 and 161.

ONE DOLLAR A MONTH MAINTAINS THIS FLASHER

The W & T Dry Battery Flasher, operated from ordinary dry batteries with automatic lamp changer insuring continuous operation, costs less than $1.00 per month to maintain. It is a compact, inexpensive, reliable flashing mechanism—the product of an organization of engineers with over 8,000 installations of various equipments in North American municipalities.

And each installation of the W & T Dry Battery Flasher is backed by a countrywide service organization.

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TECHNICAL PUBLICATION No. 86

Also see our advertisement on Back Cover

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Is This a Fair Indictment of Police Department Reports?

THAT few police forces in the United States keep records whose value would compare even remotely with those of the average business house, is charged in a report on Criminal Statistics and Identification of Criminals, submitted December 5 to the National Crime Commission by its Sub-committee on Pardons, Parole, Probation, Penal Laws and Institutional Correction. In the opinion of this committee, of which former Governor Frank O. Lowden of Illinois is Chairman, it would seem, as the first principle in efficiency, that the head of every police force should have laid before him daily a summary of crime conditions in the city, and that at the end of the year he should make a complete public report, not merely of the arrests but of the complaints as well. The report continues:

"How can we, the public, judge the efficiency of a police force in eliminating crime if we have no records that will make possible a comparison of complaints with arrests, that is, of the amount of work to be done by the police with that accomplished? For the most part, the annual police reports are little less than ridiculous. Information as to the number of sick horses, bushels of oats for the horses, pairs of puttees bought, days of illness, number of guns, and sometimes the number of arrests, can be had, but it is useless to look for a statement as to the number of crimes reported or any facts that would enable one to judge of the efficiency of the force. How can the men be assigned to the various districts of a city if a constant watch is not kept on the varying criminality in each district? The lack of adequate statistical information bearing on the activities of the police in the suppression of crime is certainly one good explanation of the prevalence of crime in American cities."

THE AMERICAN CITY fears that this is an all too true indictment of the average police department report. Directors of public safety and chiefs of police who believe that their reports are an exception to the general rule are invited to send copies for special mention in this magazine as means of stirring up friendly emulation in other cities.

Who Appoints the Chief of Police?

A RECENT report (No. 2375) of the New York State Bureau of Municipal Information, dealing with the above question as regards cities in the state of New York, gives the required data for 59 of such cities. Summarizing the results, it appears that the police chief is appointed by the mayor in 11 of the cities; by the common council in 5; by the city manager in 3; by the commissioner of public safety in 17; the police commissioner in 1; and the commissioner of public welfare in 1; by the police board, or board of police commissioners, in 13; the board of police and fire commissioners in 2; the board of public safety in 3; the department of public safety in 1; and the board of health and public safety in 1; while in one city the city manager is also chief of police.

Items and Abstracts for DEPARTMENTS of PUBLIC SAFETY

Eliminating Fire-Traps

THE Division of Fire Prevention of the Indianapolis Fire Department, which made 117,954 inspections during the year, states in its annual report, as quoted in the February bulletin of the National Fire Protection Association:

"During the year in addition to our routine inspections we investigated hundreds of obviously unsafe, unsightly dilapidated buildings which were reported to us from all parts of the city. One hundred and eighty-one of these we considered distinctly dangerous fire hazards, and we referred them to the City Building Commissioner for further investigation and final disposition. At the close of the year we find that:

64 dilapidated dwellings, barns and shacks have been wrecked.
89 have been repaired and made safe.
1 has been destroyed by fire.
27 cases are still pending disposition."

Motorized Police Patrols

CHIEF WALTER F. REEVES, of the Police Department of Swampscott, Mass., declares in his annual report that present-day conditions have eliminated the necessity or usefulness of having policemen cover their beats on foot. He advocates the patrolling of the routes by officers in motorcycles or automobiles and asks an appropriation to cover the cost of necessary equipment.

Chief Reeves says: "The addition of patrolmen to police departments for some years past has been merely by the rule of following a beaten path. Police chiefs have lacked the courage to banish the old idea of adding policemen who walk the streets and who nowadays are of little or no value in the protection of lives and property. A well-equipped small department is far more efficient than a department with a large personnel and lacking equipment.

"A policeman walking a beat is a fine example of wasted energy and foolish expenditure of the people's money. There isn't a policeman patrolling a route in this whole country today who is giving 10 cents' worth of actual police service for a dollar of the wages paid him."

Chief Reeves, who is the youngest police executive in the commonwealth of Massachusetts, concludes his report by stating that a motorized police-patrol system is now a public necessity. He wants motor equipment for his department rather than additional men.

"Cross Railroad Tracks in Low Gear"

THE City Club Bulletin of Portland, Ore., publishes in its issue of January 27 a suggestion by W. G. Purcell that "the campaign of the railroads for reducing crossing accidents, may, by a strange irony of fate, be broadcasting rules and warnings which are actually *increasing* accidents."

"The national campaign for warning the public by picture and slogan is based wholly upon the assumption that grade-crossing accidents are due to (1) trying to beat the train to the crossing and (2) crossing tracks without some exercise of the precaution 'stop—look—listen.'" Mr. Purcell states. "My observations lead me to believe that (1) the first assumption is to a large extent incorrect and (2) the second is incorrect in a peculiar way that is actually endangering the lives of the very people who are ready and anxious at all times to comply with the warnings."

The real danger, Mr. Purcell believes, lies in the fact that "automobile drivers do not have an instinct concerning the behavior of multiple-cylinder engines at low speed. They cannot be taught this instinct en masse, but a simple rule will, I think, provide an effective substitute:

'CROSS RAILROAD TRACKS IN LOW GEAR.'

"'Cross Crossings Cautiously' is in my opinion the very procedure (from the mechanical point of view) which endangers the cautious man for the reason that 'cautiously' to him means 'solwly,' but this slowly in his driving consciousness says 'slow down the motor and thus logically slow the car,' *thus leaving him helpless for an emergency pickup.*"

Highway Grade Separation

as a safety measure and as a means of facilitating traffic is receiving increasing attention. Important information on this subject will be found on pages 17, 75, 77 and 91 of this issue.

Automobile Deaths for 76 Large Cities

for the years 1926 and 1927, as reported by the United States Department of Commerce, are tabulated on page 146.

Let the Boy Scouts Help You

How the boy scouts of Rochester, New York, and the Rochester Engineering Society cooperated in the making of a traffic count which is proving of practical value to the municipal officials and civic organizations of that city, is told on page 147. The forms used are also reproduced, on page 149.

Various Phases of Fire Fighting and Fire Prevention

are discussed on pages 88, 136, 139, 140 and 142.

Conflagration Proof!

Isolated Fire Alarm Headquarters, Fall River, Massachusetts

The disastrous fire at Fall River, Massachusetts, Feb. 2, proves again the wisdom and economy of a modern fire alarm system.

Five years ago Fall River modernized its fire alarm system. The central office was put in an isolated fire-resistive building, and the wires put underground.

This spectacular conflagration which was confined to the business district would have wiped out most of the city, leaving thousands homeless, with possible loss of life, if it had not been for the fire alarm system.

Embers carried by the high wind set fires at twenty-five different places in the city, thereby necessitating twenty-five different alarms being sent in over the facilities provided for such an emergency—the fire alarm system. Every one of these fires was extinguished quickly because of the prompt working of this system, the efficient work of the Fall River Fire Department and the outside aid.

The telephone operators stuck to their posts until the flames were licking at the building and the force was ordered out by the firemen. All telephone communication was suspended and the city was forced to rely on the fire alarm telegraph.

The fire alarm circuits in the downtown area were virtually all underground. Only one circuit was in trouble and that only for twenty minutes. Only three boxes were out of service, and these right in the heart of the conflagration where it was impossible to work on them.

The city officials of Fall River have the satisfaction of knowing that their foresight contributed largely to preventing a city-wide conflagration that would have ranked with the worst the country has known.

The city officials who have charge of other fire alarm systems have this same opportunity—and same responsibility.

The Gamewell Company

Newton Upper Falls, Mass.

"A Box A Block"

Vol. XXXVIII
No. 3

443 Fourth Avenue
New York

The American City

MARCH
1928

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Problems in the Separation of Highway Grade Crossings

By LESLIE G. HOLLERAN
DEPUTY CHIEF ENGINEER, WESTCHESTER COUNTY PARK COMMISSION, BRONXVILLE, N. Y.

THE highway grade-crossing elimination problem is only one of the many phases of the broader problems of adjusting our all too inadequate highway system to the needs of modern traffic.

In the days of the horse-drawn vehicle and in the early days of the automobile, the separation of grades at intersecting highways was unthought of. With the advent of 23,000,000 motor vehicles on our roads and the resulting congestion, however, it has been conceded for some years past by both traffic and safety engineers that the separation of grades at important highway intersections is highly desirable for three principal reasons, namely:

(a) To increase the capacity of highways.
(b) To reduce monetary losses due to stoppage of motor vehicles at crossings.
(c) To promote safety at such intersections

The inconveniences, delays and losses due to the overcrowding of the heavy-traffic highways near cities on week days and the pleasure traffic routes on Sundays and holidays has been a matter of such common observation by laymen and engineers alike that few statistics need be presented to convince anyone that many highway grade crossings should be eliminated.

What Does Congestion at Intersections Cost?

Attempts to evaluate the losses due to delays at grade crossings have been made. In a paper entitled "Grade Crossings, The Money Value of a Car-Minute," Fred Lavis, consulting engineer for the New Jersey Highway Commission, concludes that the average cost of a passenger car-minute is 1.0 cent, for smaller commercial vehicles 2.2 cents, and for trucks 2.3 cents. Others have estimated as high as 3 cents per car-minute for passenger cars and 5 cents for trucks.

With these car-minute costs as a basis, and considering the number of vehicles delayed at grade crossings every day, it

FIG. 1. PALMER AVENUE BRIDGE, BRONX RIVER PARKWAY, NEW YORK CITY

can readily be seen that the annual losses due to such delays must be enormous. It has been estimated that the cost of vehicular congestion on Manhattan Island alone totals $500,000 per day, and in the entire New York region amounts to as much as $1,000,000 per day. The losses in the regions of other centers of population are no doubt in proportion. The question arises as to how much the authorities are justified in spending to minimize such losses by the elimination of highway grade crossings.

The state of New Jersey is constructing a new through traffic highway from the westerly end of the Holland Tunnel to a point near Elizabeth, a distance of about 13 miles, at a cost of over $30,000,000. This highway is designed to carry 20,000,000 vehicles per annum. Mr. Lavis in the above-mentioned paper has calculated that the state would be justified in spending $6,600,000 to eliminate one crossing; $7,200,000 to eliminate three crossings, and $8,000,000 to eliminate five crossings.

By means of a traffic census, observations of average delay or reduction in capacity of any particular highway, together with the car-minute costs given above, an approximate estimate of the amount which it would be justifiable to expend in the elimination of any highway grade crossing can be reached.

In the case of principal highway intersections, especially those near centers of population, the desirability of eliminating grade crossings is so evident from whatever point of view the problem is approached, that engineers and highway officials everywhere will no doubt be called upon before long to study and design the structures and appurtenances necessary to the proper separation of grades at such locations. The organization with which the writer is connected, The Westchester County Park Commission, has had to meet this problem many times in the construction of the parkway system in Westchester County, N. Y., during the past ten years.

Speeding Up Traffic in Westchester County

Westchester County has an area of about 450 square miles and a population of approximately 500,000. The assessed valuation of taxable real estate for 1928 is $1,318,000,000, an increase of $175,000,000 over 1927. This exceeds the individual total assessed valuations of about fifteen states of the Union. The county is developing very rapidly and the population is increasing at the rate of 25,000 per year. The growth is greatest, of course, in the areas nearest the city of New York, and south of a line drawn from Rye on Long Island Sound to Tarrytown the growth has been increasing at a rapidly accelerating rate. The more northerly sections of the county are growing, but at a somewhat slower rate.

Westchester County is what may be called the front door-yard or vestibule of the city of New York, and a large proportion of the traffic from the city to the north and east passes up through the county on two principal highways—the Boston Post Road on the east side parallel to Long Island Sound, which carries the most intensive day and night traffic of any road out of the city, and the Albany Post Road parallel to the Hudson River on the west side. Each of these is an ancient highway which passes through the business center of every city and town which it traverses. The result is that the through traffic superimposed on the local business traffic has brought about intolerable conditions on these through roads. The traffic on other main highways throughout the county had also increased beyond their capacity.

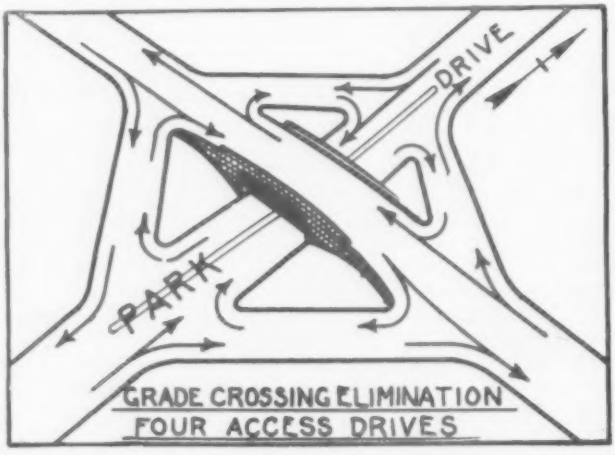


FIG. 2

In 1922 prominent business men and county officials realized that something radical must be done in order to remedy the traffic situation and provide recreational facilities before the development of the county was seriously retarded. The result was the passage of an act by the New York State Legislature empowering the Westchester County Board of Supervisors to appoint Commissioners of the Westchester County Park Commission.

As a result of its studies, begun in 1922, the Commission came to the conclusion that the solution of the traffic problem lay in the construction of additional traffic routes up through the county parallel to the Albany Post Road and Boston Post Road, but away from the business sections of the municipalities through which they were to run; also the construction of additional cross-county routes.

As studies for the particular routes and parks were completed, funds were made available by the Board of Supervisors, the necessary lands were purchased and construction work started on some of the routes. The total amount appropriated to date is about $46,800,000, of which about $30,700,000 was for land and about $16,100,000 for construction.

165 Grade Separations Proposed

In planning 140 miles of new routes, we have separated the grades at all principal highway intersections, super-elevated curves, kept the radii of curves to a minimum of 700 feet, provided a modern lighting system, and plan to install a modern system of traffic regulation.

It is expected that a speed of 40 miles per hour will be allowed on the new parkway drives.

To date, the Commission and its predecessor, the Bronx Parkway Commission, have constructed, or partly completed, 32 highway crossing separations. Funds are available for 6 other separations, and the completion of the parkways which have already been approved will require 127 more, a total of 165.

Types of Grade-Crossing Elimination

The ideal arrangement at a highway grade-crossing elimination provides access roads at all four corners as indicated in Fig. 2. In built-up sections, however, such an arrangement is often impracticable, except at prohibitive expense, due to the location of costly buildings or other structures, or topographical features in one or more of the corners. We have constructed a number of eliminations with two access roads. In a few cases, only one access has been built. This form is undesirable and should be avoided if possible.

Most of the principal driveways on the lower part of the county are planned for an eventual width of 60 feet of pavement, and the bridges over the driveways are built accordingly. The minimum clearance at the curb is 11 feet and at the center of the arch 15 feet.

In view of the very appreciable cost of these structures, economy of design is essential. Fig. 3 shows a reinforced concrete rigid frame structure which has been worked out by the Commission's Designing Engineer, Arthur G. Hayden, and which we have used in the majority

our grade separations. Most of our elimination structures are faced with stone. We feel that the economies of Mr Hayden's design have allowed the Commission to secure these structures, including the stone facing, at about the same cost as for the ordinary concrete design with heavy abutments and without the stone facing.

The Place of the Architect in Bridge Design

The Commission has employed architects in the design of all its bridges. The architects are furnished with limiting dimensions, and with that as a basis furnish sketches showing their ideas. These are examined as to economy and appearance and, if they are unsatisfactory, other architectural sketches are furnished until a satisfactory design is found.

It has been our experience that architecturally attractive bridges which harmonize with their surroundings, such as in Fig. 1, can be constructed at little or no increase in cost over the usual haphazard designs prepared wholly by the engineer.

It is amazing what an appreciation the general public is beginning to have for attractive designs in structures. Unless the engineer voluntarily collaborates with the architect in the design of his structures, the time is not far distant when the engineer will find himself in a subordinate capacity, making the structural designs as an employee of the architect. It is not sufficient, as many engineers seem to think, to turn over a completed structural design to an architect to "doll up." The lines of structure are of much more importance than the ornamentation. The architect ought to be in on the design from the outset.

In a number of the simpler cases shown, where the intersecting highways were carried over the parkway drive, the structures alone, including stone facing but exclusive of the excavation above the grade of the parkway drive and exclusive of paving, cost only $50,000 to $55,000. In other cases where the parkway drives were carried over the intersecting streets and large quantities of fill were needed in approaches, the separations, including approach fill, but exclusive of paving, have cost up to $100,000, and in a few cases as much as $150,000.

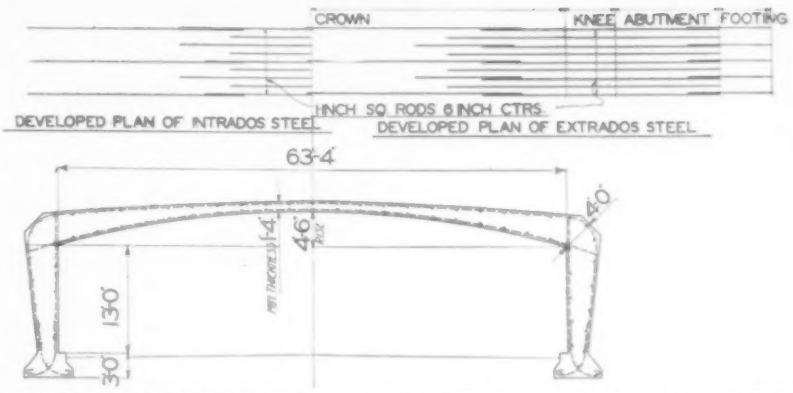
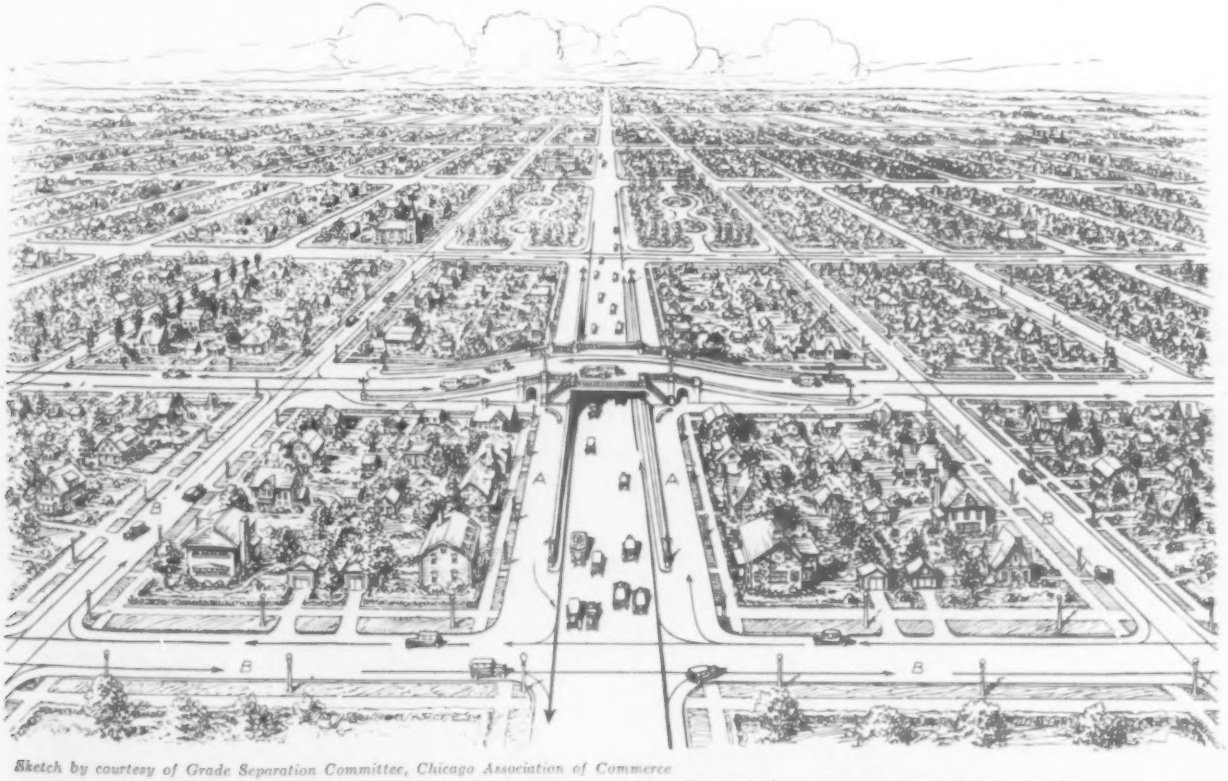


FIG. 3. CROSS-SECTION OF REINFORCED CONCRETE RIGID FRAME STRUCTURE

* ACKNOWLEDGMENT.—From a paper read at the annual meeting of the Association of State Highway Officials of the North Atlantic States, at Atlantic City, N. J., February 16, 1928.

Proposed Grade Separation Plan for Highways in Cook County, Ill.



Sketch by courtesy of Grade Separation Committee, Chicago Association of Commerce

FOR A BRIEF DESCRIPTION OF THIS METHOD OF HIGHWAY GRADE SEPARATION, SEE PAGE 17

The Sewage Treatment Works at Delaware, Ohio

By WILLIAM L. HAVENS

ASSOCIATE, GEORGE B. GASCOIGNE, CONSULTING SANITARY ENGINEER, CLEVELAND, OHIO

DELAWARE, OHIO, a city of about 10,000 people and the home of Ohio Wesleyan University, has just completed the construction of a new sewage treatment works in order to abate nuisances and to prevent the pollution of the Olentangy River. This river, which has a drainage area of about 400 square miles above the city, flows south along well-traveled highways and densely populated territory, and joins the Scioto River at Columbus. Gagings show that the flow in the river varies considerably during the year, from a maximum of perhaps 12,000 cubic feet per second to a minimum of less than 1 cubic foot per second. While these flow records indicate that for perhaps 70 per cent of the year it might be possible to discharge the untreated sewage of the city into the river without the creation of nuisances, the flow during the warm summer and early fall months is practically negligible. This condition has given rise to threatened suits from property owners along the river.

History of Project

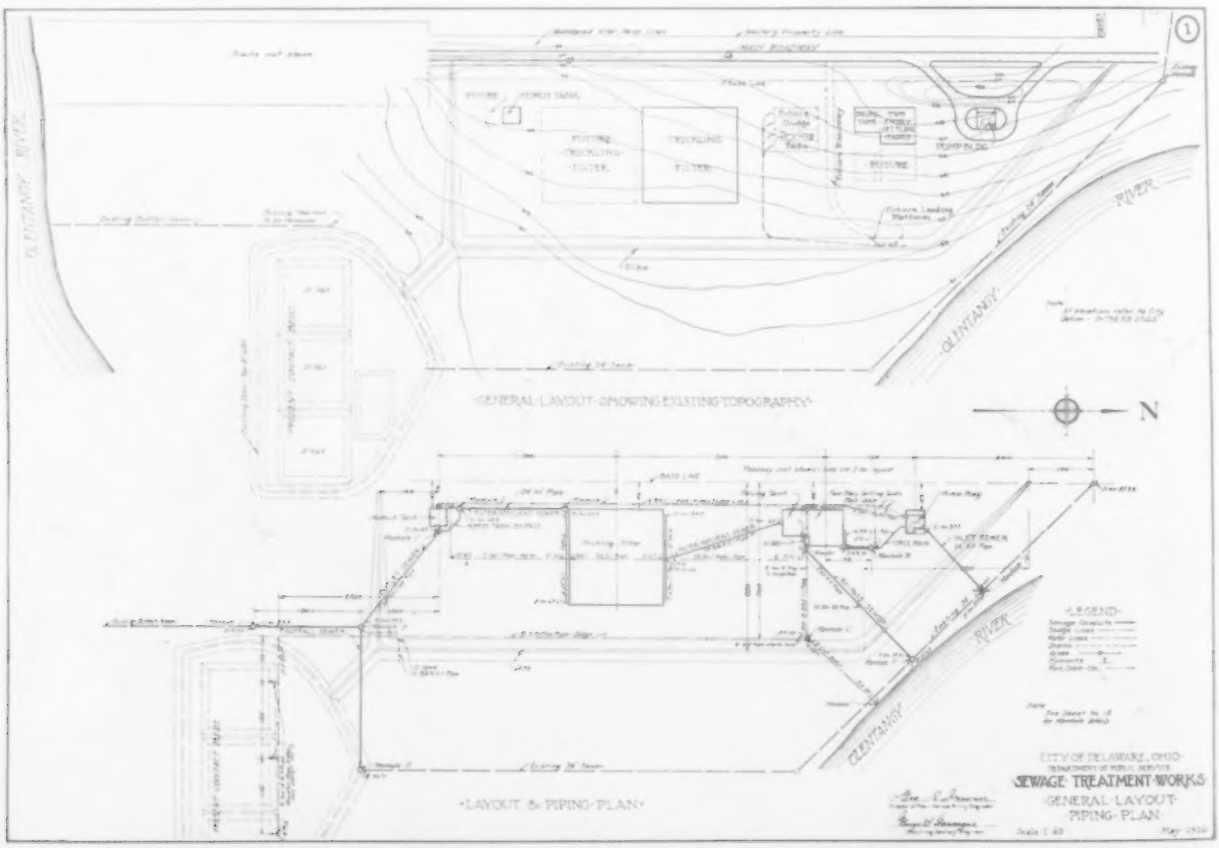
The sewerage problem of Delaware is not a new one but has been under consideration for the past twenty-five years. In fact, as early as 1902, a sewage treatment works consisting of septic tanks and contact filters was constructed in accordance with plans prepared by John P. Force. Within four or five years, complaints were received that, on account of neglect and failure to operate the treatment works, the Olentangy River was being seriously polluted. Apparently, no determined effort was made to improve the operating conditions of the old plant, and it was not until the early spring of 1926 that the city ordered a report made as to the best method for eliminating the nuisance. This action resulted in the preparation of plans and the construction of a new plant of the Imhoff tank-trickling filter type. The old plant has been entirely abandoned, with the single exception that the existing contact filters will be used temporarily for the disposal of the sludge from the new plant. All other structures were found to be either inadequate or unsuitable.

Methods of Financing Improvements

Proceeding under Section 1259 of the Ohio General Code, the City Council authorized the sale of 10-year, 5 per cent bonds in the amount of $215,000 to cover the cost of the new treatment works. At the time of issuance the total valuation of city property was about $13,900,000, the tax rate 17.20 mills, and the net bonded indebtedness of the city about $108,000.

Description of New Works

The new treatment plant was designed to serve a population of 14,500 persons. This figure was based upon an estimated



population, fifteen years hence, of 15,000 persons, 85 per cent of whom will be provided with sewerage facilities, plus an allowance of 2,000 persons for the student population attending Ohio Wesleyan University.

The average sewage flow, based largely upon water-consumption records, was estimated at 100 gallons per capita daily, and the treatment devices were designed for a maximum flow of 3.63 m.g.d. and a minimum flow of 0.50 m.g.d. The general arrangement of the treatment plant structures is shown on the accompanying plan. The new treatment works are located in a bow of the Olentangy River just north of the old plant. This site is owned by the city and is sufficient in area to fulfill all requirements for at least fifty years in the future.

CONSTRUCTION OF TRICKLING FILTERS WITH DOSING TANKS AND TWO-STORY SETTLING TANKS IN THE BACKGROUND, DELAWARE, OHIO

Type of Plant

Since there was available only about 5 feet of head between the invert of the sewer opposite the plant site and the low-water surface in the river, pumping of the sewage was obviously necessary for all types of treatment works affording secondary treatment, with the possible exception of the activated sludge process. This process was eliminated on account of high operating costs and possible difficulties attendant upon the operation of a small plant of this type.

On account of the fact that borings showed a hard limestone rock at an elevation of about 17 feet below the average ground surface at the plant site, it was considered advisable to pump the sewage ahead of the settling tanks, permitting gravity flow throughout the remaining steps of the treatment process. This procedure was more economical, since it allowed minimum rock excavation in the construction of the settling tanks and afforded a means for protecting all of the structures from flooding. Also, since the excavation costs for two-story tanks were nominal, this method of treatment proved less expensive than single-story separate digestion units.

Pumping Equipment

The sewage, after passing through the bar gratings, flows to a wet well, from which it is elevated by means of two horizontal centrifugal pumps to the inlets of the two-story settling tanks. These pumps have a capacity of 2 m.g.d. each and operate against a total head of about 35 feet. They are designed to be fully automatic in operation and are controlled by floats in the wet well.

The water-supply for the entire plant is obtained from a flowing well drilled 65 feet into the limestone rock, the normal water-level in the well standing about 15 feet above the floor of the pump building. The water-supply and air-pressure pumps are also automatic in their operation, being governed by the pressure in the receiving-tank.

Preliminary Treatment

The sewage is first screened through bar gratings having 1-inch clear openings, the screens being raked by hand and the screenings elevated from the pit by means of an ash hoist. No grit chambers have been included in the present design, since the sewer system has been developed and is being operated upon the separate plan. Provision has been made, however, in the layout for the future installation of grit chambers, if found necessary.

For clarification of the sewage, Imhoff tanks have been constructed. These tanks were designed to provide a detention period for average flow conditions of 120 minutes and a total capacity of 4.50 cubic feet per capita. They are two in number, each 28 by 60 feet in plan, having a total water depth of 25 feet 6 inches, and are designed with through trough bottoms. Provision is made for cutting either tank out of service and for reversing the flow through either or both tanks. The sewage enters the tanks through cast iron pipe and valves instead of open channels, to avoid deposits and unsightliness.

Drains are provided in the bottoms of the tanks for completely emptying them by gravity. The sludge is removed hydraulically and water pipes are conveniently located for stirring up the sludge and assisting in its removal. Skimming chambers, adjustable scum boards and hinged gas vent covers are also provided.

At the outlet weir from the settling tanks a float gage is installed with connecting piping to the pump building for measuring and recording the sewage flow through the plant. This flow may also be checked from the record of the pump operation and from the dosing tank counters.

Secondary Treatment

From the Imhoff tanks the sewage flows to two units of dosing tanks having a working capacity of 19,400 gallons each. These tanks are equipped with twin alternating 20-inch siphons for discharging the contents of the tanks alternately into the distribution system of the trickling filters. Each compartment is designed with sloping sides in order to give uniform distribution from the nozzles, which discharge under a head varying from 2 feet to 8 feet. The space under the sloping sides of the dosing tanks provides storage for small tools and other equipment.

The trickling filters are arranged in two units and provide a total area of 0.55-acre. This area corresponds to a loading of 26,400 persons per acre. The normal rate of dosage will be 2.64 million gallons per acre daily, and the maximum rate 6.60 million gallons. The filters consist of 7 feet of broken limestone, 1¼ to 2¾ inches in size, overlaid with a 1-foot layer of crushed granite. The additional cost of this top layer of granite is believed to be justified on account of the disintegration which has occurred in many limestones and slags as a result of the alternate freezing and thawing action to which the top layer of filtering material is subjected. The gallery extending through the center of the filter area is a 3-foot by 5-foot concrete channel which affords access to the underdrains for flushing purposes. The main influent header extends along one end of the filter and consists of a 16-inch cast iron pipe from which extend 8-inch cast iron pipe distributing laterals spaced on 13-foot centers. These distributors are laid directly in the filter, sufficiently beneath the surface to be just covered. Nozzles having 1-inch orifices are spaced

15 feet on centers in rows staggered in such a way as to form hexagons. Half nozzles are used along the sides and ends of the filters. The underdrain system consists of vitrified channel blocks upon which are laid vitrified supports for the filtering material. The entire floor is sloped toward the main collecting gallery, and provision is made along the opposite sides of the filter for flushing out the channel drains.

The effluent from the trickling filter flows to the final settling tank, which consists of a square tank, 30 by 30 feet in plan, having a water depth of about 7 feet. This tank provides a detention period of 45 minutes and is equipped with a revolving mechanism of the Dorr type for the continuous removal of sludge.

Disposal of Sludge

The sludge removed from the humus tanks will be pumped either to the sludge compartments of the two-story tanks or directly to the disposal area. The sludge from the two-story tanks will be removed by gravity, and for the present will be discharged upon the surface of the old contact filters. This method of disposing of the sludge is considered temporary and will later be replaced by the construction of covered sludge-drying beds.

Buildings and Parking

The pump building, in addition to housing the sewage pumps and other mechanical equipment, was designed large enough to provide a covering for the bar gratings and an office for general administration and laboratory control of the plant. The sludge pumps for the final settling tanks are also housed in a building. The buildings are of red face brick with limestone lintels and sills and green tile roofs.

The site is provided with roadways and walks and has been sodded and seeded to make the surroundings attractive. The entire area has been surrounded with a dike to prevent damage from high water. The up-stream face of this dike has been protected from the wash of floods by riprap. The fill used in the recently abandoned right-of-way of the Pennsylvania Railroad has been utilized for the roadway along the north side of the plant site. However, this railroad siding was maintained during the construction period and was used for the delivery of materials at the site of the work.

Provision of Operation Funds

In order to provide sufficient funds for operating the new works, and thus eliminate the difficulties experienced with the old plant, the city has proceeded in accordance with the Ohio Sewer Rental Law enacted in 1922. In accordance with an ordinance passed by the City Council, charges will be made against all sewer connections. These charges are based upon the nature and use of the connection rather than upon the water consumption records, since the water-supply facilities in Delaware are privately owned. It is estimated that the annual revenue obtained from rental charges will amount to about $11,000, which will provide not only for maintenance and operation of the sewage treatment works, but also for the maintenance of the sewerage system and the cost of clerical work required by the collecting agency. The average charge per dwelling connection will amount to about $4 per year.

The work has been done under the direction of George S. Irwin, Director of Public Service, with George B. Gascoigne as consulting engineer. Bruce A. Barr has been the resident engineer during the construction work, over which the writer has had general supervision. Bids were received for the work on August 4, 1926, and the general contract for the construction work was awarded to the Pitt Construction Co., Pittsburgh. Sewage was first passed through the plant in November, 1927.

Costs

The following table has been prepared to show the subdivision of costs of the various treatment plant units:

CONSTRUCTION COST—DELAWARE SEWAGE TREATMENT WORKS

	Cost per Capita	Per Cent of Total Cost
Channels, conduits and pipe lines	$0.65	4.7
Pumping installation	1.05	7.5
Imhoff tanks	2.46	17.6
Dosing tanks	.77	5.5
Trickling filter	5.21	37.5
Final settling tank	.89	6.4
Buildings	.94	6.7
Parking and dike	1.58	11.4
Miscellaneous	0.37	2.7
	$13.92	100.0

It is to be appreciated that the above costs represent only the construction cost of the treatment plant and do not include such items as land, rights-of-way, engineering, advertising and legal expenses. These items normally approximate 15 per cent of the total cost of the project, but in the case of Delaware were somewhat less on account of the fact that the city already owned the treatment plant site.

The New Greenville, Ohio, Water-Softening Plant

GREENVILLE, OHIO, is located in the western central part of the state, and the population is about 8,000. It is the center of a rich agricultural section with very few industries. Water consumption averages about 600,000 gallons per day.

The water-supply of Greenville is from deep wells, with a supply from Greenville Creek available. Water is treated in a modern softening plant, employing lime and soda as softening reagents. Water is pumped from the wells by air lift and then is pumped to the mixing chamber at the plant by motor-driven centrifugal pumps. After passing through the softening plant to a clear well, distribution is effected by motor-driven, high-service pumps with a gasoline-generator stand-by unit. A standpipe on the distributing line tends to equalize the pressure. Two of the high-service pumps are equipped with automatic starts and stops which are actuated by the pressure on the system.

The purification and softening plant consists of two steel mixing tanks, a Dorr clarifier, a settling basin having a five-hour retention period, four filters, only three of which are equipped, of ¾-million gallons daily capacity each, and a 500,000-gallon clear well. Dry-feed chemical machines, a chlorinator and equipment for recarbonation of the settled water are provided.

Well water has been used as a source of supply since the plant was put in service, and the chemical content is constant. Treatment consists in the application to the raw water of 16 grains per gallon CaO; three grains per gallon Na_2CO_3; 0.8 grains per gallon aluminum sulphate; and CO_2 to the settled water. Analyses of the water before and after treatment are as follows:

	Raw	Filtered
Total alkalinity	365	82
Phenol alkalinity	0	1
Incrustants	90	43
Total hardness	455	126
Free CO_2	8	0
Magnesium	45	15
Iron	1	0.1

Alum and soda ash are applied to the low-service main a few feet from the point of discharge in the mixing tanks. Lime is applied directly into the first mixing tank. These tanks are operated in series and have a retention period during normal operation of 27 minutes each. Mixing is effected by mechanical agitators driven by ¾-horsepower motors. They make one revolution every 45 seconds. Water from the mixing chambers passes through the Dorr clarifier. This has a 40-minute retention. From the Dorr clarifier the water passes into the settling basin. At the outlet end of this basin there is a compartment where CO_2 is applied to the water before it passes to the filters. CO_2 gas is generated by burning coke, and it is introduced into the water by compressing the gas in an air-compressor and distributing it through a ¾-inch brass grid system perforated with 1/16-inch holes. From the recarboration chamber water passes through the filters to a 500,000-gallon clear well.

A much more satisfactory supply has resulted from the treatment of water in this manner. Hardness is reduced from 455 parts per million to 125 parts per million, and iron is removed. The cost of chemical treatment is $33.50 per million gallons.

Abstract of a paper read at the Sixth Annual Ohio Conference on Water Purification.

Who Should Own the Water Meters?

A Study Based on Reports from 3,282 Cities and Opinions of Leading Water-Works Consultants

Webster L. Benham

Benham Engineering Co.

Kansas City, Mo.:

It is usual for the municipality or corporation to own the water meters. In my opinion, this is the correct method. We see no reason why the consumer should be required to furnish the meters. The water meter is really part of the service to be furnished by the city water department or the water company. It is customary, and I believe justified, for the city water department or the water company to require a deposit on each meter, such deposit to be approximately the amount of the cost of the meter. It is believed that where the consumer owns the property, a deposit should not be required. The city, or the water company, should pay interest on the amount of the deposit for the use of the money.

R. L. Baldwin

Burns & McDonnell Engineering Co.

Kansas City, Mo.:

It is our observation that more and more of the cities and privately operated water-works are furnishing water meters for the use of their customers. Some years ago, a report prepared by the New England Water Works Association, based upon an investigation of some 150 water-works systems, showed that at that time the utility was furnishing the meters in 77 per cent of the cases investigated. Possibly this figure was high at that time for this part of the country, but at the present time we believe it would not be so.

The ownership of the meter by the utility furnishing the service is much to be desired, as it is best for all parties concerned. When the meters are purchased by the consumer, it results in a great variety of makes being installed in service and the water department has to be prepared to maintain these meters; hence, it necessitates carrying a great variety of repair parts and a much larger investment than is necessary for that purpose.

Meters should be tested periodically to determine their accuracy, and when they are privately owned it often causes considerable trouble with the owner when the meter is removed for test purposes. It also necessitates the return of the identical meter taken out, as it is the customer's private property. This causes the water utility to make two trips and at least doubles the cost of making tests.

Where meters are owned and furnished by the utility, it is possible to standardize on a few makes or types of meters requiring a minimum of repair parts and to make regular tests as to accuracy with a minimum of friction with the consumer.

Our experience leads us to believe that the only objection to ownership of meters by the utility is the matter of cost and that this is entirely offset by the disadvantages of customer ownership.

DISTRIBUTION OF OWNERSHIP OF WATER METERS IN CITIES THROUGHOUT THE UNITED STATES AS REPORTED IN THE MUNICIPAL INDEX

State	Number of Cities Reporting	City	Private Company	Consumer
Alabama	32	21	9	2
Arizona	14	7	7	..
Arkansas	20	20	14	5
California	121	77	36	8
Colorado	38	26	1	11
Connecticut	44	18	26	..
Delaware	7	4	..	3
District of Columbia	1	1	..	..
Florida	44	32	6	6
Georgia	67	45	1	21
Idaho	24	14	5	5
Illinois	179	70	19	90
Indiana	109	62	34	13
Iowa	145	57	9	79
Kansas	128	85	4	39
Kentucky	45	17	22	6
Louisiana	40	21	14	5
Maine	34	19	13	2
Maryland	18	14	3	1
Massachusetts	141	111	15	15
Michigan	127	95	4	28
Minnesota	110	41	4	65
Mississippi	34	26	3	5
Missouri	83	26	15	42
Montana	27	19	5	3
Nebraska	83	24	1	58
Nevada	7	3	4	..
New Hampshire	28	19	6	3
New Jersey	109	42	55	12
New Mexico	14	11	3	..
New York	202	99	30	73
North Carolina	72	58	3	11
North Dakota	20	7	1	12
Ohio	156	71	21	64
Oklahoma	88	79	3	6
Oregon	36	20	11	5
Pennsylvania	268	50	175	43
Rhode Island	15	3	5	7
South Carolina	41	28	3	10
South Dakota	26	9	2	15
Tennessee	34	29	5	..
Texas	149	108	28	13
Utah	13	9	..	4
Vermont	17	10	6	1
Virginia	39	36	3	..
Washington	55	30	14	11
West Virginia	37	9	26	2
Wisconsin	106	73	6	27
Wyoming	16	9	2	5
	3,282	1,764	682	836

H. Burdett Cleveland

New York:

It has always seemed to me that, in accordance with the common practice, all water meters should be furnished, installed and owned by the water department or water company.

The need for uniformity of equipment is best met by such practice; the most complete control over water-charge determinations requires such ownership; and facility in the matter of repairs and adjustment is best assured if ownership of the meter is lodged with the water department or water company. Furthermore, unfounded complaints over incorrect readings are much more apt to arise if consumers have a proprietary interest in meters.

Justification for ownership of meters by water departments or water companies lies in the fact that meters form a part of the control system of water-works while service connections, although on private premises also, do not fall under such classification. Conservation of water, which is an increasing problem in many sections, and the metering of services to this end, are best carried out by full municipal or company control of meters.

George W. Fuller
Fuller & McClintock
New York:

The question as to whether the water department or company or the consumer should own the meters is one upon which the operating official is much better qualified to express an opinion than is the consulting engineer. From the viewpoint of the engineer whose business it is to report upon the needed scope of water-supply works and to construct such works with their extensions and betterments, the vital consideration is to secure the installation of meters, in order to keep water consumption within reasonable limits and avoid unnecessary expenditures for supply works. To the consulting engineer, therefore, the question as to who shall own the meters is not particularly important.

Weston E. Fuller
Swarthmore, Pa.:

It is now much more common to find the ownership of the water meters with the utility, whether it be the municipality or a private company. In some states, utility commissions have compelled the companies to purchase and install the new meters and sometimes to purchase the older meters from the consumers.

Ownership by the utility seems the simpler and more logical method. Ownership by the consumer means only that he is compelled to carry a small part of the capital investment required to furnish him with water. Formerly, when meters were installed more or less at the option of the consumer, there was more reason for such ownership.

It is usually the utility which purchases and installs the meter, no matter who pays for it. The utility reads, tests, repairs and replaces the meter. It is to the interest of the utility to keep the meters in good repair in order to avoid the slippage of water past the meter without registration. Failure to properly test and repair meters results in the loss of revenue due to this slippage. This necessitates the rather frequent removal of the meter and its replacement with another. After repair, the meter is installed elsewhere in the system. There is no way of properly charging the consumer with the cost of testing, repairing and replacing meters where the work is for the benefit of the utility. It is essential for the utility to have full control of the meter at all times from its purchase to the end of its life. This can best be done by direct ownership.

F. G. Gordon
Gordon & Bulot
Chicago, Ill.:

It has been our observation that water meters are more often owned by the water department or company than by the consumer. Among those clients whom we have served, we know of only two cities in which the meters are owned by the consumers. One of these cities has a population of 3,000 and the water plant is municipally owned. The other city has a population of 30,000 and the water plant is owned by a company. This company, however, is purchasing the water meters belonging to the consumers.

We think there can be no question that ownership by the water department or company is proper and best in both large and small communities. The purchase, installation, maintenance, reading and checking usually are accomplished more efficiently and economically if ownership rests with the water department or company, rather than with the consumer.

Some of the evils of consumer ownership are avoided when the agency furnishing water purchases the meters and sells them to its consumers. When, however, the system in use permits the purchase of meters from dealers by consumers, there is an economic loss which the consumer must bear both in first and in maintenance costs. The first cost is higher under these conditions because of lack of centralized purchasing power, while the maintenance costs are higher because of the variety of makes which must be serviced.

Even when the water department or company sells the meter to the consumer, there is more opportunity for friction. This may arise over the question of a desirable location for the meters, over the need for testing the meter, or over the cost of repairs.

If a city or company considers it desirable to use meter seals, these can be affixed without difficulty when the meters are not owned by the consumer. Most consumers resent the placing of such seals on meters belonging to them.

One argument that may be advanced for individual ownership of meters is the fact that such ownership relieves the water department or company of a certain financial burden. From an economic standpoint, this argument is not sound, since an increased investment in property account should carry with it a corresponding return in revenue sufficient to cover the interest and depreciation on the investment.

To sum up, it may be said that the purchase and installation of meters by one central body effects economies, both for the consumer and for the water department or company, and ordinarily results in better relations between them.

George B. Gascoigne
Cleveland, Ohio:

Very seldom do engineers in private practice have the opportunity to pass upon the question as to whether house-service meters should be owned by the householder or by the utility. Also, this task usually occurs in setting up a water-supply department as a going concern.

The problem may be stated as follows: House service meters cost from $8 to $13 each in the usual size. In the aggregate, the investment is a tangible one upon which interest and replacement charges must be earned. Is the burden of this investment offset by any compensating benefits which do not accrue to other than utility ownership?

Several pertinent factors often lead to the conclusion that there are some tangible and peculiar advantages in the freedom of control, manifested chiefly in the ability to replace or repair defective meters readily, and further, to prescribe standards or models. As a matter of fact, it is quite feasible to accomplish these ends where ownership is other than in the hands of the utility, so that the advantage is possibly that of convenience rather than of more essential nature.

Prevailing practice in the kindred services of gas and electricity is that ownership of the meters very generally rests in the franchise and quite possibly as franchise requirement. Among water departments custom is diverse, but the trend of progress is toward utility ownership. This condition is particularly true among the larger departments and also almost universal with the smaller works of recent development.

Ordinarily, it appears to be good practice for a water department to purchase the meters in bulk, and in the smaller communities to issue these meters to plumbers for installation without charge or deposit. In the larger communities the water department should install the meter. The meters remain the property of the department or community and are maintained, tested and repaired by the department. Repairs should be charged for when due to consumers' negligence.

Paul Hansen
Pearse, Greeley & Hansen
Chicago, Ill.:

As consulting engineers, we have not come into contact with the routine administration of water-works, so that we are not in a position to give a very weighty opinion regarding who should own the meters. We have a decided attitude, however, in favor of ownership of water meters by the water-works and not by the consumers, wherever this is possible—and it is generally possible. The arguments in favor of this are as follows:

1. No objection can be raised on the part of the consumer as to the make, type, and cost of the meter.
2. The water-works authorities are

free to remove a meter and substitute another one.

3. Water-works authorities are free to test a meter at any time and make whatever repairs are necessary.

4. The meter may be placed wherever it best suits the convenience of the water-works authorities.

The only valid excuse for requiring the consumers to pay for their own meters is the inability of the water-works authorities to finance the purchase of meters, but even this difficulty can be overcome by requiring the consumer to finance the purchase of meters. This was done at Springfield, Ill., by requiring the consumer to make a deposit sufficient to enable the water-works authorities to install a meter. Each month the water bills were rebated for this outlay, until the consumer was fully reimbursed.

Allen Hazen
Hazen & Whipple
New York:

Mr. Hazen stands by his statement in "Meter Rates for Water Works," pages 106 and 107, regarding the ownership of water meters: "With respect to the meter there is no question but what it is the best policy for the works to furnish it and to own it. This is the only method that gives the works the full control of the meter with power to take it out and test it and replace it with a new meter, or repair it whenever the conditions of service make it desirable.

"The advantage of this procedure, and the disadvantages of having the meters owned by the takers, are so great and so well known to all practical water-works superintendents that there should be no question upon this point. The works ought to own the meters in all cases."

Nicholas S. Hill, Jr.
New York:

I have felt for years that meters should be owned and controlled by the water purveyor. They not only measure the water but the income of a water property, and should be in unrestricted charge of those who derive such revenue. In a number of states the public utility commissions have required the water purveyor to take over water meters owned by the consumer.

The only advantage of consumer ownership is that the water purveyor is saved some capital outlay, but, on the other hand, if the water purveyor makes this outlay, it is entitled to earn a fair return as well as the cost of maintenance, repairs, and depreciation, so that, after all, there is not much to be said in favor of the private ownership.

I think you will find that the places in which the meters are owned by the consumer and owned by the water purveyor are pretty well distributed.

L. R. Howson
Alvord, Burdick & Howson
Chicago, Ill.:

The usual method of ownership of water meters in the properties with which we are in contact is that the meters are owned by the water department or the company. It is very rare that the consumer owns the meters, and in one of the few cases that have come under our notice a transfer is now being made from the consumer to the company by purchase.

In my opinion, ownership, whether for a large or a small community, should rest in the water department or company. Among the principal reasons for this opinion are the following:

1. The water department or company is the only one interested in maintaining the accuracy of registration. Water meters cannot over-register, but it is known that under-registration occurs to an increasing extent with use and age. The company is interested in securing full registration and is willing to incur the expenditures necessary for proper maintenance and part replacements. The consumer, having no such interest and profiting from under-registration, is not at all interested in keeping the meter in proper operating condition.

2. Where meters are owned by the company or water department instead of by the consumer, there is less likelihood of dishonest consumers tampering with the meter.

3. Under public utility regulation, it is immaterial to the consumer whether the consumer or the water department owns the meter. If the meter is owned by the consumer, he must make the direct capital expenditure; whereas, if it is owned by the company or water department, he must pay the fixed charges, including depreciation and maintenance thereof.

4. It has been our experience that where the consumers own the meters, that fact is a continual cause of friction and usually one that a private company cannot afford to have, even though it might not be able to earn fixed charges on the investment in meters.

5. Ownership of meters by the water department or company insures the installation of fewer types, simplifies the stocking of repair parts and the making of repairs, and assists towards selection of that meter best adapted to the local conditions as determined from past experience.

6. Consumer ownership will result in deferred maintenance and replacements and quite frequently results in arguments as to expenditures necessary for these items when demanded by the company.

In conclusion, we are of the opinion that the ownership of water meters should rest in the water department or company rather than the individual consumer.

George A. Johnson
New York:

I am convinced that the ownership of devices measuring water service should be placed in the hands of the company or department rendering such service, otherwise it is difficult to see how the consumer can get a square deal or the purveyor receive a fair return for the service he renders. Private ownership of meters is a troublesome matter, for reasons that need not be described.

It is my personal experience that private companies exert every reasonable endeavor to acquire the ownership of meters on their water-works systems, because only in this way can they maintain them in proper working condition, and assure not only themselves but their customers a fair measure of the water service rendered. In municipal water departments the ownership of meters is equally advisable, and if such departments are as competently managed as are the meter divisions of private companies, the same rule obtains. I cannot see how there can be two opinions in this regard.

With the ownership of water meters vested in the purveyor, he has complete control of the meter, and is able to standardize on one make of meter, or select and control the particular type of meter required for a specific service, as well as the control of repair and maintenance work.

I have discussed this matter with numerous people, and the reply is always the same. Why should the measuring instrument be the property of the purveyee? In this case anything which is required by or done to the meter to keep it in condition must have the sanction of the purveyee, which is not always easy to get. There frequently arise controversies as to who shall pay for meter repairs, and often a constant source of irritation between the consumer and the company is thus established.

Where the meter is bought and owned individually, the cost of the meter and its installation will be materially greater than would be the case were the meters purchased wholesale and installed and controlled by the water department or private company. The undivided ownership and responsibility for the installation, maintenance and upkeep of all facilities required for the delivery of water to the property line of the consumer should be vested in the purveyor, be it a municipal water department or a private water company. The cost is less, the service better, and the possibility of

friction from this source between the purveyor and the consumer eliminated. In the case of connections used exclusively for fire protection lines, it is probably permissible for meters of the detector type to be paid for by the consumer, although this is not always the rule.

To my mind, individual private ownership of water meters is an impossible proposition, and I do not at all like the idea of municipal ownership of service meters where the water-works systems are privately owned or operated. I believe the ownership of water meters should be vested in the purveyor, even though it is the practice in such large cities as New York and Philadelphia to delegate meter ownership to the consumer.

Arthur L. Mullergren
Kansas City, Mo.:

Our experience has been that by far the greater number of cities and companies own and maintain the water meters. A few of the smaller cities and companies require the consumer to furnish and install a meter, but in all such cases this is done for financial reasons.

It is our opinion that the company or water department ownership of water meters is by far the best procedure for any size utility, as the meter is the cash register of the system and the revenues obtained depend entirely upon the successful operation of these meters. The companies, by owning such meters, exercise complete supervision and can make the necessary tests, repairs and replacements as they deem justifiable. Furthermore, uniformity in make and type of meters is secured by company ownership and this facilitates repairs and replacements and requires the carrying of fewer parts and supplies. Furthermore, the responsibility for the successful operation of the meter is placed upon the company or water department, and this is where it belongs, as it is as much a part of the system as the water-mains.

Alexander Potter
New York:

On water-works systems with which the writer has been identified during the past thirty years, the ownership of meters has not been at all uniform. Many water companies for which the writer served as consulting engineer have placed the financial burden, not only for meters but also for house connections, upon the consumer. In some instances, this has been due to the fact that the companies have had rather close sailing financially; in other instances there has been an honest conviction that meters at least should be considered the property of the consumer. Water companies have not been alone in this desire to place the burden of water meters upon consumers, for many municipalities have assumed a similar attitude.

There seems to be no question but that the trend at the present time is away from this policy and, more and more, meters are considered—and, in the writer's opinion, properly so—the property of the water company or the municipality. It is the writer's belief that there is very little to be said in favor of the ownership of meters by the consumer.

It is true that the meter is generally placed on the premises of the consumer or within that portion of the service which must properly be considered the property of the consumer. However, the consumer has no great reason for interfering with the operation or control of the meter. In an overwhelming majority of cases he is not even a contributory cause to any defects that may occur in the meter. Consequently, there is no reason why a meter should be considered the property of the consumer. If a meter be so considered, an attempt might be made to assess the cost of repairs or renewal to the consumer; but, as in very few cases can he be held responsible for any defects that might occur in the meter, there is no justification for charging any particular consumer with the expense of repairs to any particular meter. Repairs to meters should be borne by the company or the municipality as a whole, and a fair charge for replacing or repairing meters should be reflected in the rates which the water company, as a whole, must meet.

If the consumer owns the meter, he should repair it, but his facilities for so doing are nil. He should test the meter, but, again, he has no facilities for so doing.

If the consumer owns the meter he should also have the right to select it, but a lack of uniformity in make of meter would cause expensive maintenance, and individual purchases would be less economical than those made by wholesale.

All portions of the water-works, including the meters, must have a central control to secure accuracy and efficiency, which is most important to the municipality or company and, consequently, to the consumer as well.

Charles W. Sherman
Metcalf & Eddy
Boston, Mass.:

The great preponderance of practice as to the ownership of water meters, in so far as my experience allows me to judge, is in favor of ownership by the water department or company, except in the case of large meters, which are commonly required to be furnished by the consumer. It seems to be almost uniformly the opinion of water department and water company authorities that such ownership by the utility is desirable, and that ownership by the consumer should be considered only when difficulties of financing the investment make it impracticable for the utility to purchase them.

In my opinion, this point of view is based on sound reasoning. It has frequently been said that the water meter is the cash register of the water-works system. Certainly, no merchandising concern would consider having the cash registers furnished by the customers, and substantially the same argument applies in the business of selling water.

It is, however, practicable for the water department or company to make regulations governing the installation, testing and repair of meters under which their control is probably sufficient to ensure the proper upkeep even though owned by the consumer, and this practice is justifiable when, for any reason, the other is impracticable.

N. T. Veatch, Jr.
Black & Veatch
Kansas City, Mo.:

We know of a large number of plants where the meters are owned by the water department or company, and some where the consumer is required to purchase his own. The latter arrangement is not followed as extensively as the former.

As to our opinion of the two schemes, we can see no good reason for the consumer's owning his meter, and quite a number why he should not. In the first place, all meters should be tested at regular intervals and this testing can best be, and in fact should be, done by the water department or company. Perhaps an ordinance or a regulation of a company could require all testing to be done by the water department, but a great deal of argument regarding the time and manner of testing can be avoided when the ownership rests with the department or company furnishing the water. Also, arguments in regard to the type and price of meter will not be a subject of argument. The consumer cannot say he could buy a cheaper meter than the one suggested or required.

As a matter of fact, the principle of the ownership remaining with the water department or company is sound. There is just as much reason for a grocery store, a meat market, or any business selling commodities by weight, to depend upon scales either brought to the store by a customer or furnished at the home. He is entitled to check the amount of goods sold, by weighing on standard scales of known accuracy. There are no doubt cases where a merchant's scales need checking, but such cases are rare. A city water department or a water company has the same right

to measure the amount of water supplied to its customers. A water meter, if geared properly and tested, will seldom if ever over-register; in fact, most of them slow up and often stop. The party furnishing the water should own and have complete charge of all meters, with the possible exception of special meters for special service, such as detector meters, etc.

Robert Spurr Weston
Weston & Sampson
Boston, Mass.:

Practically all the works which we serve or come in contact with, own, set, read and repair the meters through which the water is furnished.

In our opinion, it is best in all cases for the municipality or the water company to own and manage the water meter. This plan insures uniformity of type, lower cost of repairs, and greater accuracy, and lessens stealing of water. Where the burden of ownership is too great to be borne by company or city, this may be alleviated by charging a fair rental or a readiness-to-serve charge, sufficient to cover the same. The cost of metering is a fair charge to the consumer.

The only logical exceptions to ownership are the cases where the meters are large in size or of a special type. Because these are really special contrivances, special arrangements regarding them may be best in certain cases.

Robert C. Wheeler
Barker & Wheeler
Albany, N. Y.:

Our experience has been largely confined to locations where water meters are owned by the municipalities or water companies. In the writer's opinion, the ownership should rest with the utility.

In order to secure effective results from metering, the meters should be tested systematically and frequently. If the customer owns the meter, this means two trips for each meter tested and the substitution of another meter during the time the first meter is out of service. Whereas, if the utility owns the meter, it can be taken out and replaced with another which has been properly tested, all in the one operation.

The object of installing meters is to conserve water and to place the expense for service where it belongs. It is therefore important to have the meters register accurately, and our experience is that meters which have been in service for some time under-register. The percentage of meters which for any reason over-register is negligible.

In one instance under the writer's observation, the gross revenue was increased over 10 per cent by a systematic campaign of overhauling meters, during which time there was no appreciable increase in the water pumped and filtered The meters above referred to had averaged being in service not more than four years.

Such control is much more feasible under ownership by the utility than by the consumer, and for that reason we feel that in the long run better results are obtained if the meters are owned and maintained by the utility.

There are other arguments, such as the fact that the utility can buy both meters and repair parts cheaper, but the fact that the meter is one of the most vital parts of the system in that it controls the revenue and should be kept in a high state of efficiency is the most important consideration.

V. W. Whitfield
E. T. Archer & Co.
Kansas City, Mo.:

As regards the meter policy followed by the various plants, we believe it could best be described by the term "confused," although the meter, in the long run, is invariably paid for by the consumer. However, the method of payment varies. In one city the meters are furnished the consumer under a rental agreement; in another, the city furnishes the meter but raises the price of water sufficiently to amortize its cost; in another, a meter deposit is exacted which, strange to say, is exactly the cost of the meter; and in yet another the customer is required to buy the meter, but the city buys it back whenever the consumer ceases to take water.

Policies of efficiency and economy dictate that the city shall purchase the meter from the manufacturer. Then the question arises as to how the cost shall be passed on to the consumer. Should it be a direct sale, with the consumer handing over a check, the meter neatly wrapped and the consumer departing with it under his arm? Well, possibly, but we fail to see where some are going to benefit by this arrangement, and if the consumer is one of those classified by a prominent Kansas editor, as a member of the "Spit and Argue Club" he will, in preference to paying the cost of the meter, continue to draw his water from either his own or his neighbor's well and the water department will lose a customer. On the other hand, if he is the head of an industry using a large amount of water he would probably be content to have the city furnish the meter, as long as he is satisfied as to the correctness of its registration, and would be willing to pay for it in any way that would suit the department.

Therefore, the question really resolves itself into a discussion as to the type of the majority of customers with which the water department has to deal, and how they will best be satisfied; and it is difficult to make any rule that will apply to all plants.

In any city, however, there are some consumers to whom a ten-dollar or even a three-dollar meter deposit will make a real difference, and may be important enough to justify their refusal to connect to the mains. Therefore, if a meter rental can be added to the bill, either as a direct charge, or thinly disguised under the cost of water, it is our opinion that possibly a few new consumers may be gained and the sales of the water department increased.

In any case, we wish to put ourselves on record as being firmly opposed to the old flat-rate system, and unless the Mayor of Chicago propounds some argument we have not as yet heard, we will continue in the belief that it is only by the use of meters that it is possible to place the Water Department on a paying basis.

H. F. Wiedeman
Wiedeman & Singleton, Inc.
Atlanta, Ga.:

The usual practice of water departments in the Southeast is to make a connection charge when the water service is installed. No uniform policy is pursued in the various water departments in making this charge, and as a result the amount of the charge varies widely.

Some departments make the charge cover the entire cost of tapping, and installing the service and meter; others make a charge for tapping and a meter charge, and compel the property owner to install the service line between lead connection and meter, while still others make a connection charge without specifying what the charge covers. A number of departments make no charge.

Practically all water departments, however, assume the cost of maintenance, repair and replacement of the meter. The ownership of the meter by the property owner is therefore largely theoretical.

It has been the policy of electrical utilities in this section to furnish an electrical meter and make installation without charge. Consequently, the payment for water-service connection and meter in many cases results in argument and misunderstanding between the water department and the property owner as to what the charge covers and why it is made.

It is difficult to justify requiring the purchase of the water meter by the property owner or consumer. As a matter of fact, the consumer who has a flat rate usually objects strenuously to the installation of a meter under any condition. The requirements as to payment for meter and water service lines are largely a matter of precedent or expediency.

It is my opinion that the water department should own the meter and that its cost should be charged to capital account.

Enlargement of Jacksonville, Fla., Municipal Electric Plant Under Way

By ELLIOT W. BUTTS
MANAGER, JACKSONVILLE CHAMBER OF COMMERCE

AN expansion program costing $2,000,000 and designed to serve 300,000 persons is being carried on by the city's electrical department in Jacksonville, Fla. Under the guiding genius of Commissioner of Utilities Frank H. Owen, who has gathered around him experts in power operations, the building program will not throw an increased burden of cost on the customers of the light and power plant, but, on the contrary, will enable the plant to supply electricity at a reduction of approximately 15 per cent.

Under present plans the entire system of distribution and increased power facilities will be completed within the next fifteen months. Engineers in charge of the work have reported to Commissioner Owen that a major portion of the system will be completed and placed in operation early this spring.

A large percentage of the funds will be expended in enlarging the facilities of the main power-plant on Talleyrand Avenue, where new boilers, a new turbo-generator, new condensers, new switchboard and much other equipment are to be installed and a building is to be constructed to house it. It is estimated that the work here will cost in the neighborhood of $1,250,000.

At present activities concentrate on the boiler-house and the foundation for the turbo-generator. The foundation for the steel work of the boiler room, the turbo-generator and all of the brick and masonry work of the tunnels and buildings are being done by the Hearn Construction Co., a Jacksonville concern.

The tall steel skeleton of the structure to house the new equipment towers about 100 feet into the air. It is being assembled and erected by the Virginia Bridge and Iron Co. The cost of this phase of operation, including the foundation and other concrete and masonry work, will be $197,653.

The new boilers to be installed in the plant are unique in design and are three in number. Each has a capacity of 1,500 horsepower at 100 per cent rating and is said to have a capacity of 550 per cent rating when operating under forced draft. The boilers measure about 75 feet high from ash-pit to top drum and are constructed to burn either coal or crude oil. They are of the Babcock and Wilcox type and together with auxiliary equipment will cost about $235,000.

Turbo Can Handle Entire Load

The huge turbo-generator is now being made in the plant of the General Electric Co. at Schnectady, N. Y. It will soon be ready for shipment, and plans call for installation sometime in May. This machine when installed will be able to handle the entire load of the plant, according to Commissioner Owen. It will cost completed $358,000.

Installation of the furnace is to be done by the Combustion Engineering Co., at a cost of $213,000. Condensing equipment and other auxiliary machinery will be installed by the C. H. Wheeler Manufacturing Co. for $89,000. Contracts for other work are being let from time to time as the program demands.

The new equipment at the plant, by increasing the efficiency of the establishment, will enable the $2,000,000 bond issue voted for the improvement and expansion program to be retired out of earnings.

The Schofield Engineering Co. of Philadelphia is serving as consulting engineers on the program.

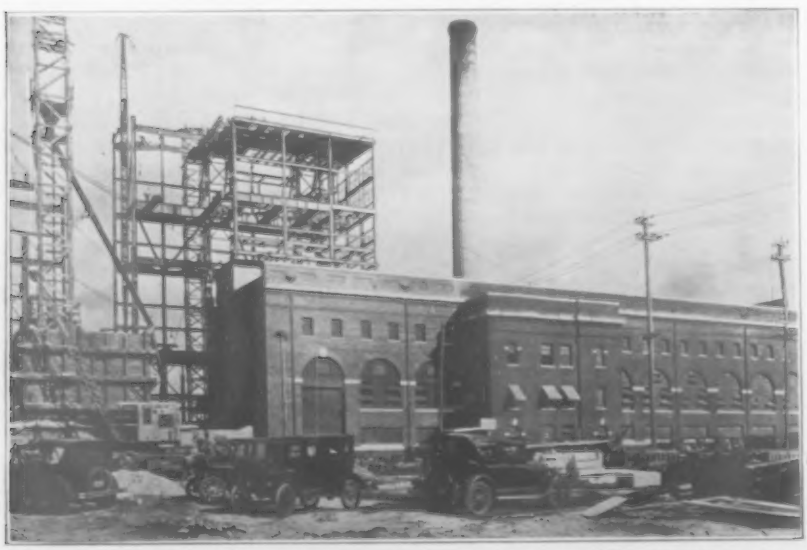
History of Plant

In 1893 the city was authorized by the State Legislature to issue $1,000,000 worth of improvement bonds, $75,000 of which was specifically set aside for the purpose of building and equipping an electric light plant. From the proceeds of this issue, the construction of the plant was begun in 1894, completed in 1895, and began operation under the supervision of that branch of the city government then known as the Board of Public Works. This board continued to operate the plant until 1899 (June), at which time our city charter was changed and the management passed into the hands of the Board of Bond Trustees. Since the 1917 charter amendment the plant has been under the supervision of the City Commission.

In addition to the original bonds of $75,000, a new issue of $27,500 in 1901 and another of $100,000 in 1913 and $850,000 in 1923 were sold, making a total of $1,052,500; $200,000 having been retired in 1926, leaves outstanding against the plant at this time $852,500. In 1912 a new plant was built and changes made in the old one (now used as a substation), at a cost of approximately $635,000, and in the following year gross earnings were over $600,000.

Successful at Low Rates

The plant has earned much more than enough to make all necessary improvements and pay operating expenses. The generating plant is worth over $2,500,000 exclusive of outlying equipment, and has proved to be the most valuable asset the city owns. We not only deliver current to our consumers at a very reasonable rate, one of the lowest in the United States, but it saves the taxpayers at least 6 or 7 mills annual tax by reason of transfers made to the general fund. No assessments have been made on account of the construction cost of the plant; but, as stated above, bonds were sold, and the plant has long since repaid the taxpayers many times more in profits. The rates now in effect are



JACKSONVILLE MUNICIPAL ELECTRIC PLANT, WITH EXTENSION BEING BUILT

practically the same as for a number of years past, except slight changes in those on power. It has been the policy of the different administrations to keep the operation of the plant entirely away from politics, and this one thing alone has been of inestimable value to the taxpayers.

The gross earnings of the Electric Light Plant for 1927 amounted to $2,466,934.75; the net earnings for the year were $1,376,363.42. These figures show an increase of $296,977.03 in gross earnings over 1926, as compared to an increase in operating expense of $73,790.00. The gross earnings of the plant over a period of 29 years amounted to $20,250,988.95, and net earnings $11,233,225.54. The operating expenses for 1926 were 46 per cent of the gross earnings, while for 1927 they were but 44 per cent.

Residential and Commercial Rates

The rate for lighting and general service is 7c per kwh., with a minimum charge of 50c per month, subject to the following discounts:

Where the consumption of each separate metered service equals or exceeds

$ 50.00 per month, 10 per cent
100.00 per month, 15 per cent
150.00 per month, 20 per cent
200.00 per month, 25 per cent
300.00 and over, 40 per cent

Electric service outside the city limits will be furnished provided applicant pays to the city the cost of the necessary extension of the line from the existing line to the premises to be supplied, the rate to be 10c per kwh., minimum 75c per month, with the above discounts. Other parties to have the privilege of getting electric service connection to the extension, provided they pay to the previous applicant or applicants a pro rata share based on the original cost of the extension, the amount to be subject to approval by the City Commission; also paying for the extension of the line to the premises to be supplied.

The rates for residential lighting and cooking, combined on one meter, and applicable only to residence or apartment lighting and the use of ordinary household devices, ranges, and water heaters, with certain limitations, are as follows:

7c per kwh. for the first 35
5c per kwh. for the next 40
2c per kwh. for all over 75
Minimum charge $1.00, per month

Outside the city limits, 10c per kwh. for the first 35, 5c per kwh. for the next 40, and 3c per kwh. for all over 75 kwh., with minimum charge of $1.50 per month.

The rates for commercial cooking and heating are:

3c per kwh. for the first 500
2½c per kwh. for the next 4,000
2c per kwh. for the next 5,000
1½c per kwh. for all over 9,500
Minimum charge $5.00, per month

Outside the city limits, 4½c per kwh. for the first 500, 3¼c per kwh. for the next 4,000, 3c per kwh. for the next 5,000, and 2½c per kwh. for all over 9,500 kwh., with minimum charge of $7.50 per month.

Power Rates

The rates for 2,200-volt, 60-cycle power, subject to a minimum of 5,000 kwh. per month, are:

2c per kwh. for the first 10,000
1¾c per kwh. for the next 15,000
1½c per kwh. for the next 50,000
1¼c per kwh. for all over 75,000

Outside the city limits, 2½c per kwh. for the first 10,000, 2c per kwh. for the next 15,000, 1¾c per kwh. for the next 50,000, and 1½c per kwh. for all over 75,000 kwh., per month.

The San Francisco Plan for Non-Political Municipal Utility Operation

CITIES that own public utilities have various methods of operating them, the agency for this purpose sometimes being a board, department or commission having a variety of duties, or a similar organization or official restricted to the conduct of a single utility, or some other method, including that of lease to a private or public corporation, under municipal control. San Francisco, which has the distinction of having been for many years committed by its charter to a general policy of municipal ownership of utilities, working out in a partial degree through the Board of Public Works under the more or less complete control of the Board of Supervisors (the governing body of the city), will vote on a charter amendment this fall, approved by the latter board, for the establishment of a non-political utility commission to administer all the city's utility enterprises. The proposed plan is described in the February number of the *National Municipal Review*, by Dr. Delos F. Wilcox, public utility expert, of Grand Rapids, Mich., who has studied the San Francisco situation at various times, and spent about two months in that city in the fall of 1927 preparing a preliminary plan for consolidation of the municipal and private street railways as the franchises of the latter expire during the next few years. He says in part:

"The San Francisco plan for the administration of municipal utilities, if adopted, will set a landmark for the entire country. The comprehensive nature of the plan is expressed in the first section of the proposed charter amendment as follows:

"'The construction, management, supervision, maintenance, extension, operation, and control of all public utilities and other properties, used, owned, acquired, leased or constructed by the City and County of San Francisco, as well as all extensions, additions and betterments thereto, for the purpose of supplying to the said city and county and its residents and inhabitants, and territory outside the limits of said city and county and the residents and inhabitants thereof, with water, light, heat, power or transportation, shall be exclusively vested in a utility commission of three members, anything in this charter to the contrary notwithstanding. The commission shall have power to make all rules and regulations not inconsistent with the provisions of this article which it deems necessary or proper for the conduct of its business and the regulation of the matters herein committed to its charge.'

"The commission will consist of three members appointed by the mayor subject to confirmation by the board of supervisors. The terms of office will be six years, except that the first appointees will hold office for two, four, and six years, respectively. Commissioners will be removable in the same way as elective officers.

"The commission must appoint, as its chief executive and administrative official, a manager of utilities, who need not be, at the time of his appointment, a resident of the city. The commission may create departments or bureaus, with submanagers or directors. Neither the manager nor the sub-manager will be subject to civil service rules, and they will hold their positions at the pleasure of the commission. An auditor and all the other employees, subordinates and assistants required for the conduct of its business may be appointed by the commission subject to civil service rules, except that persons employed on construction work outside of the city and one personal secretary or confidential clerk to the manager and each sub-manager will be exempt. Also, the civil service rules will not apply to 'persons employed for temporary service in positions requiring high technical skill.' The operating employees of any utility taken over by the city will retain their positions and acquire a status in the civil service, if they have been employed for at least a year before the utility is taken over.

"The manager of utilities will have the power of suspension over the employees of the commission for cause or for disciplinary purposes. The commission may continue a suspension for disciplinary purposes for a time not to exceed thirty days, and may order the manager to prefer charges against a suspended employee. Removals by the commission will be subject to the appeals provided for in the civil service rules.

"Construction work is to be done by public contract unless, upon recommendation of the manager, the commission decides that the work can be more advantageously carried on by its own employees.

"One of the greatest problems in municipal operation of street railways is the control of extensions. In this matter the commission will be supreme."

Each separate utility is required to stand by itself and have its own budget; reserves for depreciation, accidents, compensation insurance, and pensions are provided for; services rendered a utility by other city utilities or departments are to be paid for. Rates must be made sufficient to cover the total cost of service, excepting that the Board of Supervisors, by two-thirds vote, may, on recommendation of the commission, authorize a lower rate.

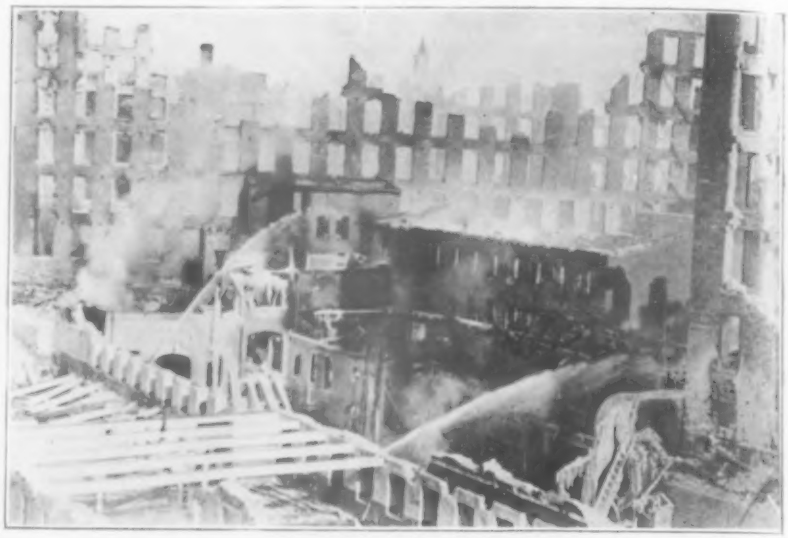
Incandescent Lamps for Government Use Must Average Thousand Hours of Life

INCANDESCENT electric lamps purchased by the Government must have an average of 1,000 hours, and must maintain their initial candlepower output to about 90 per cent, according to the revised specifications issued February 6 by the Bureau of Standards.

Those interested in the subject should write to the Superintendent of Documents, Government Printing Office, Washington, D. C., for Bureau of Standards Circular No. 13, 11th Edition. The price is 5 cents per copy.

Fall River Conflagration May Aid City Plan

A LARGE portion of the business district of Fall River, Mass., was laid waste by fire on the night of February 2. The blaze started in the Pocasset Mills, four large stone buildings in process of demolition. Their smoking ruins are shown at the right. Some 33 buildings were affected, the insurance loss on these being in excess of $4,000,000. Even a number of so-called fireproof buildings were completely gutted because of wooden window-frames, or the lack of wired window-glass. That the fire did not spread further is largely attributable to the aid received from fire departments of other cities—some from as far as Boston and Providence. The next photograph below is of a truck from New Bedford. The bottom illustration shows the ice and snow conditions that added to the difficulty of subduing the fire.



Fall River has a City Planning Board as a part of the city government. The Board is working on new maps as a result of the conflagration and has called upon Arthur A. Shurtleff, its official consultant and the author of the city plan that the Board had adopted, to make further studies. A Citizens Committee of Fifteen, representative of the business men of the city, has also been appointed, following a meeting that was called by the Mayor on February 3, in which the President and the Vice-President of the Chamber of Commerce took leading parts. This committee is cooperating with the city government in the desire to take advantage of the opportunities for rebuilding the center of the city in a finer and better way, and with due regard to the adequate handling of traffic. The Board of Aldermen on February 6 named a committee to cooperate with the other agencies.

Building plans, private as well as public, are being held in abeyance until a general plan is arrived at through the efforts of the constituted agencies. A 12-story fireproof hotel, a large theater, and one or two business blocks are projected, but are awaiting the action referred to. One public development being considered is the uncovering of a portion of the Quequechan River, which crosses the center of the city under the streets, to provide an open space there, with flowing water. All in all, though the devastation is hardly comparable to that in St. Louis last year or in London in 1666, both referred to in THE AMERICAN CITY for January (pages 114-116), nevertheless here again is presented a notable opportunity for reconstruction in the light of careful city planning, an opportunity that St. Louis is acting upon but which London lost.

Public Works Construction the Best Available Prosperity Reserve

By OTTO T. MALLERY

INDUSTRIAL RELATIONS COMMITTEE, PHILADELPHIA CHAMBER OF COMMERCE

THE recent introduction into Congress by Senator Wesley L. Jones, of Washington, of the bill quoted in the accompanying "box," gives hope of action by the Federal Government which, if supplemented by similar action by the state and municipal governments throughout the United States, would go far to prevent a repetition at any future time of "panic" conditions and "hard times" such as prevailed in 1921 and in many previous periods of business depression.

What Is Prosperity?

Prosperity is simply the smooth and steady running of our economic machinery at its best speed. If it begins to slacken or rattle, there is danger. For prosperity, all the gears must be properly in mesh.

This is because all businesses, all industries, all communities, are dependent upon each other. Busy factories, steady employment, good wages, high buying power, prosperous communities, busy stores, big and frequent orders, busy factories—these constitute the machine of prosperity.

Because of the close intermeshing of all industries, if we could really stimulate even one important industry when there are signs of a recession, that would be enough to liven up the whole machine. If we were to set down the specifications for such an industry, it would be one which

(a) Represents a considerable volume of business in itself.

(b) Is located in practically every community so that all parts of the country would benefit.

(c) Calls for products from many other industries.

(d) Could be stimulated at the right time by simple action with the minimum amount of effort.

The ideal industry which meets every one of these logical specifications is the construction of public works.

The construction industry has had an annual volume of seven billion dollars during the past three years, fully one-tenth of the volume of all the country's business. Public works represents between one-fourth and one-third of the total of construction. It is a two-billion-dollar industry in itself, and millions of our people are directly or indirectly dependent on it.

Public works construction is not a centralized industry like steel or automobile or cotton textiles; it is an important industry in every community, big or little, urban or rural. The rural county builds highways and institutional buildings; the city builds streets, sewers, water-works and public and educational buildings; the state builds highways and highway bridges, drainage systems and public buildings; the Federal Government builds roads, irrigation systems, river and harbor improvements and more buildings. Wherever there are people, there must be public works.

As examples of the magnitude of the various kinds of public works construction, the values of only the more important projects during 1926 (as estimated from the Department of Commerce Yearbook) were:

Water-works	$61,647,000
Sewers	103,741,000
Bridges	83,383,000
Streets and roads	483,898,000
Excavation, drainage, irrigation	27,810,000
Federal Government work	50,262,000
Public buildings	60,890,000
Educational buildings	407,800,000
Hospitals and institutions	140,000,000
	$1,419,431,000

The total expenditure for rural road purposes, including maintenance in addition to new construction, is over $1,000,000,000 a year, according to the Bureau of Public Roads at Washington.

At least 27 other industries are dependent for a good part of their prosperity upon public works construction. Iron and steel, lumber, cement, brick, stone, lime, slate, glass, asphalt, represent only a few of the industries directly connected with public works construction. Probably a third of the railway freight tonnage is of construction materials; large numbers of trucks and other machines are used; and a large proportion of all fuel used is in the production of construction materials.

How can public works construction be made to meet the fourth specification? How can it be stimulated, at the right time, simply and effectively?

An Analogy from the Federal Reserve System

How does the Federal Reserve System stabilize the financial activity of the country? By expanding credit facilities and reducing the cost of money when there are signs of stringency and by contracting facilities and increasing the cost of money when there are signs of inflation.

How do the successful corporations assure for themselves sound financing and resources for expansion and for their security holders dividends at all times? By putting some of their profits each

A Bill to Create a Prosperity Reserve and to Stabilize Industry and Employment by the Expansion of Public Works During Periods of Unemployment and Industrial Depression

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the following sums are hereby authorized to be appropriated, for the purpose hereinafter specified, in addition to the amounts normally and usually appropriated for such purposes:

(1) For carrying out the provisions of the Act entitled "An Act to provide that the United States shall aid the states in the construction of rural post roads, and for other purposes," approved July 11, 1916, and all Acts amendatory thereof and supplementary thereto, $75,000,000;

(2) For the preservation and maintenance of existing river and harbor works, and for the prosecution of such projects heretofore or hereafter authorized as may be most desirable in the interests of commerce and navigation, $50,000,000;

(3) For prosecuting work of flood control in accordance with the provisions of the Flood Control Acts, approved March 1, 1917, and March 4, 1923, $10,400,000;

(4) For carrying into effect the provisions of the Public Buildings Act, approved May 25, 1926, in respect of public buildings outside of the District of Columbia, $15,000,000.

Sec. 2. No appropriation shall be made pursuant to the authorization contained in this Act until such time as the President finds and communicates to the Congress that the volume, based upon value, of contracts awarded for construction work in the United States, has fallen 20 per centum for a three-month period below the average of the corresponding three-month periods of 1926 and 1927.

—Introduced in the Senate of the United States January 11, 1928, by Senator Jones; referred to the Committee on Commerce.

year into surplus and reserves.

That was exactly the reasoning of the National Committee on Unemployment called by Secretary of Commerce Hoover in 1921 to study the serious problems of depression and suggest solutions. This committee, consisting mostly of business men and economists, decided that the stimulation of public works was the simplest remedy and that this could be accomplished by setting up a sort of "reserve" of such work for the future, to be ready when needed. This could be done by planning public works projects ahead, by budgeting them, as it were, and by having all the preparedness program ready to go into effect upon short notice. The plan does not require the slow coordination of a great many scattered people—each community can act for itself.

"Prosperity Reserve" Is a Well-planned Public Works Program

The basic practical principles of Prosperity Reserve are:

(a) Each community, local, state and Federal administration, should set up its own "Prosperity Reserve" program.

(b) These should, as far as possible, be integrated and synchronized, so that the stimulus of the reserve should become available as and where needed.

(c) Each community and administration should plan its public work, "budget" it and make up a program adapted to an economic emergency which can be executed at short notice.

(d) Credit facilities should be arranged for; bonds sold in advance when desirable; plans and specifications drawn up in advance.

We now know more about current business conditions than ever in our history; government experts, bank economists and commercial and trade organizations are cooperating to make our knowledge of things as they really are as accurate as possible. There are many statistical indices which can tell us when a recession is beginning. Probably the best would be the simplest, such as the volume of general construction, which is well known at any given time. When, for example, volume of construction shows a marked decline for three successive months, it would serve as a signal that some of the construction work planned as "Prosperity Reserve" be started.

Each community could make its own decision, especially if its prosperity depended upon specialized industries which might suffer a recession not marked in other communities or industries.

But under ordinary conditions, such a signal could be given by the President of the United States, upon counsel of his expert advisors. Such a signal should not, of course, be a public announcement of economic emergency, as public psychology has powerful effects on prosperity and depression; it would simply be quiet advice to local authorities that the Federal Government was releasing its Prosperity Reserve and that similar action by them would be desirable.

Idle Men, Idle Machines and Idle Money Cannot be Tolerated by a Community Concerned with Its Own Welfare

What good does it do for a city to advertise its climate when that is all that a large proportion of its workers have to enjoy? A city of part-time factories is a part-time city.

In 1921, a number of cities, when they woke up to the bitterness of unemployment, "made" work. Some stopped using machines on construction work in order to give more hands employment. In at least one case men were employed to carry stones from one place to another, while a second squad carried them back. But city payroll padding is not industrial stabilization. Prosperity Reserve is not a way of "making" work. It is a scientific system for doing necessary, constructive work at the right time.

The town with a Prosperity Reserve program is the town which knows where it is going. Prosperity Reserve is not only a tonic for the run-down business of a community when times are not so good, but it is also an inspiration for its orderly development at all times.

Prosperity Reserve is the way of making community dreams come true. New days need new construction; not only are streets and water-mains and schools needed, but streets safe from grade crossings; parks and playgrounds—and airports. No longer should great sections of our people live in fear of death and destruction from floods; the long task must be planned now and carried out in the next decade, so that the menace will be forever removed.

The City Plan Is the Blueprint for Prosperity Reserve

A large proportion of American cities now have city plans which have not only given them splendid visions for the future, but also practical programs for achieving them. The city plan should be carefully studied and the projects classified with regard to urgency. All public works which should or can be done during the next five years should be carefully planned out in this way and classified, so that a larger proportion can be put under way when the economic need arises.

This means that the funds should be quickly obtainable and plans and specifications ready. The sale of bonds is the usual and the quickest way, but in some cases complicated legal procedures consume many months. In the depression of 1921 the cities were able to double their borrowings for public works because they had been prevented from selling many bonds during the war. When this doubled volume of public works got into full swing in 1922, the depression rapidly disappeared. Of course, if cities exhaust their credit in good times, they are helpless in bad times.

Prosperity Reserve is a way of saving the taxpayer's money. It does not crowd public work at a time when other construction work is being rushed and when the cost of labor and materials is high. It does not force the borrowing of money for the financing of public works projects when costs are highest. Prosperity Reserve not only is prosperity insurance, but it is community economy.

The idea of Prosperity Reserve has not only been worked out by the members of the National Conference on Unemployment, but it is heartily endorsed by:

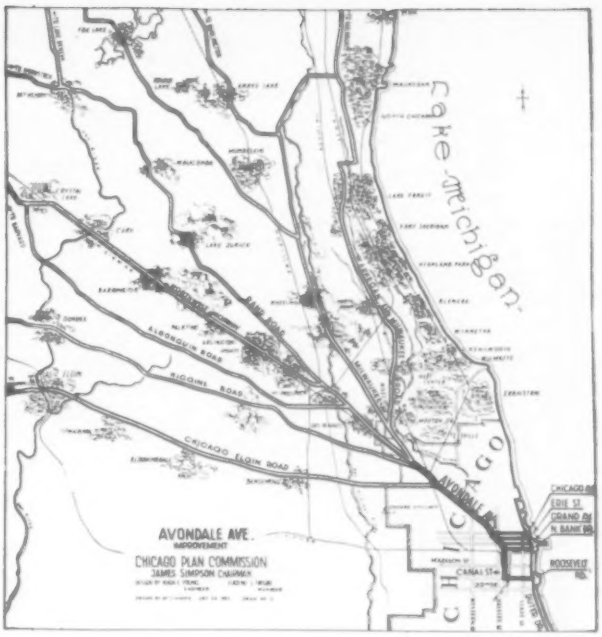
President Coolidge
Secretary of Commerce Hoover
Secretary of the Treasury Mellon
The Democratic Platform of 1924
American Enginering Council
Associated General Contractors
American Institute of Architects
American Association for Labor Legislation
Philadelphia Chamber of Commerce

Although the Federal bill is important, the cities in the aggregate are more important because they do eight times as much public work as the Federal Government. The understanding and active approval of local officials and business leaders in every community are needed. The Prosperity Reserve is the business man's problem and duty. American business should never again wait until it hears "nine" before it begins to struggle back to its feet.

How New York Is Tackling Unemployment

A SURVEY of employment conditions in New York State, made at the request of Governor Alfred E. Smith by Industrial Commissioner James A. Hamilton and reported by him on February 15, showed extensive unemployment and serious distress, with conditions the worst since 1921. The governor urged that all public works undertaken by the state be accelerated; nearly $100,000,000 is said to be available for these activities. He also appealed to the majority financial leaders in the Legislature to speed appropriation bills totaling $42,000,000, mostly for roads and bridges. The suggestion was made to cities and counties that appropriate steps be taken with respect to local improvements, to help relieve the unemployment situation. In New York City, where furtherance of the idea was at once promised, the public works program in point is reported to total more than $100,000,000.

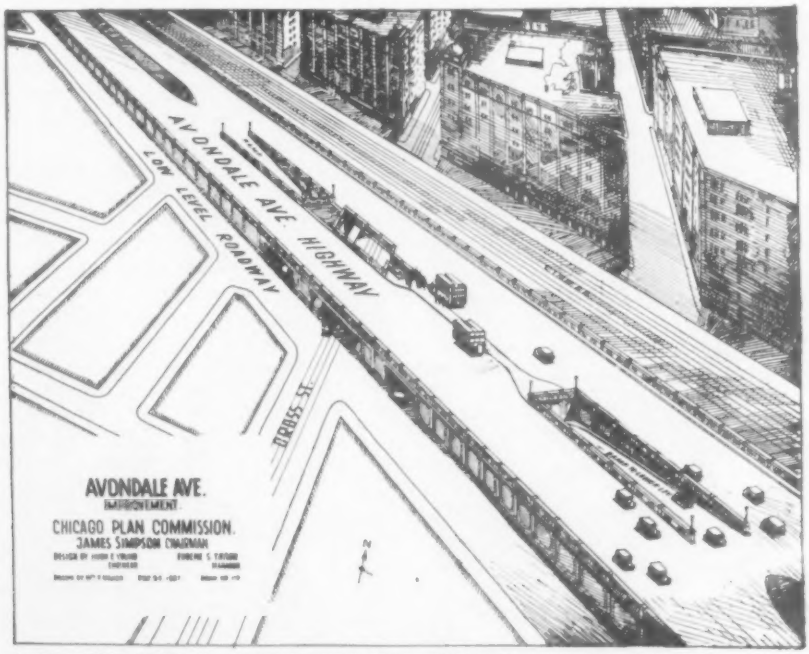
Ten-Mile $60,000,000 Motor Express Highway Proposed for Chicago



Avondale Avenue Improvement Would Provide 210-Foot Thoroughfare, Without Cross-Traffic or Left-Hand Turns, from Center of Chicago to Northwestern City Limits

By HUGH E. YOUNG
Engineer, Chicago Plan Commission

A MOTOR express highway 10 miles long and 210 feet wide, extending from the downtown district to the northwestern city limits at Jefferson, and without cross-traffic or left-turn traffic during the entire distance, is proposed by the Chicago Plan Commission. The plan provides for an elevated super-highway 160 feet in width extending the entire 10-mile length, with an estimated capacity of 250,000 vehicles per day and bordered throughout most of its way by a 50-foot-wide local, low-level thoroughfare.



A TYPICAL SECTION OF THE PROPOSED AVONDALE AVENUE SUPER-HIGHWAY, CHICAGO

The aggregate length of roadway on the steel and concrete viaduct construction is 3.5 miles. Proper drainage is provided for in the roadway grades, and there will be suitable stone balustrades and a lighting system. The aggregate length of roadway on a fill between the railroad embankment and a retaining wall is 6.3 miles. The retaining wall will extend along the railroad right-of-way, 160 feet from it, and the space between will be filled to about the level of the top rail of the railroad tracks

Over 300 miles of main improved highways, serving 1,100 square miles of territory, focus on Avondale Avenue at or near the northwestern city limits (see map). The proposed improvement, if constructed as planned, will shorten by 3 miles the distance which the major part of the traffic on all these highways now travels. It will also reduce the time required to travel the 10 miles between the northwestern city limits and the heart of the city by from 20 to 40 minutes.

The total cost of this grade separation project, including the super-highway, the low-level local street, the ramps, the balustrades, the lighting fixtures, the architectural embellishment, property acquired, building damages, construction costs and all other expenses, is estimated to amount to about $60,000,000. Of this, $37,900,000 represents construction, and $22,100,000 land and building damages.

How the Improvement May Be Financed

The city can finance its share by a bond issue and a reasonable special assessment upon benefited property. It is recommended that the county be allotted 24 per cent of the cost of the improvement, which is equivalent to the proportionate cost of a 40-foot strip of the improvement. The county officials have publicly endorsed the Avondale Avenue plan and have indicated a desire to participate in the cost, using the revenue

from the gasoline tax or other funds for this purpose. It is recommended that the state be allotted 12 per cent of the cost, equivalent to the proportionate cost of a 20 foot roadway.

On the elevated portion of the highway provision is made for two 58-foot roadways and two refuge walks. These roadways are separated by a center strip 34 feet in width, which is to be utilized for ramps to the low level, for islands, vehicle landings, stairways, and in some sections, if desirable, for planting.

The adjacent low-level 50-foot street will be a valuable adjunct in many ways. It will, first of all, preserve the motor express feature of the elevated roadway by separating it from the building line, thereby removing the possibility of parking on the express roadway, which if permitted would largely destroy its usefulness. This low-level parallel street will also serve as a marginal intersecting street between cross-streets and ramp approaches. It will permit of frontage development on the ground level along the line of the improvement conveniently accessible to cross-streets.

The property so located will become increasingly more valuable for business purposes, not only as a result of the service given such frontage by the motor express highway, but also as a result of a possible electrified service on the Chicago & North Western tracks when the demand for such traffic makes it desirable to have such service provided.

Evolution of the Idea

The idea of an elevated roadway in Avondale Avenue along the Chicago & North Western Railway extending from the west side boulevard system on the northwest side to the outskirts of the city, was first suggested in 1923 by Benjamin B. Felix to Charles H. Wacker, then Chairman of the Chicago Plan Commission, and was endorsed by Mr. Wacker in his address at the meeting of the Chicago Plan Commission on November 4, 1926.

The development of the plan from the original suggestion has been very extensive and the progress made and the character and extent of the improvement in its final form are largely due to the efforts and vision of the present chairman of the Plan Commission, James Simpson, whose practical knowledge of traffic conditions in the metropolitan district of Chicago has been of great assistance in facilitating the completion of the technical report.

VIADUCT STRUCTURE TO EXTEND NOTHWEST FROM THE NORTH BANK DRIVE, CHICAGO, ABOVE THE TRACKS OF THE CHICAGO AND NORTH WESTERN RAILWAY ON A DIRECT LINE TO CHICAGO AVENUE

The technical report was prepared by Hugh E. Young, head of the Chicago Plan Commission's technical staff. Five alternate routes were studied and the plans and estimates of cost covering each route have been given consideration by the Plan Commission's Special Avondale Avenue Committee, consisting of Joseph R. Noel, Chairman, Bernard A. Eckhart, Benjamin B. Felix, Murray McLeod, Werner A. Wieboldt, and Eugene S. Taylor, Manager of the Commission. The report of the subcommittee was approved by the Executive Committee on December 29, 1927, and has been submitted to Mayor Thompson, the City Council, and President Faherty of the Board of Local Improvements, Chicago, for their consideration and approval.

This improvement will become one of the most important projects of its kind anywhere in this country because of its length and width, its traffic separation features, its tremendous importance to the transportation plan of Chicago, and its great economic value to traffic.

THE IMPROVEMENT WILL BEGIN WITH A PLAZA CREATED BY WIDENING CANAL STREET TO 180 FEET BETWEEN MONROE AND MADISON STREETS

In the center of this plaza an inclined roadway 50 feet wide, beginning at Monroe Street, will rise to an upper level at Madison Street and continue north on Canal Street on the upper level

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NOTE.—The following unit prices have been used in computing the physical cost:

(a) The average cost of the entire improvement per square foot amounts to $4.06, exclusive of land and buildings.

(b) The average cost of the part on a fill is $2.52 per square foot.

(c) The average cost of the part on viaduct structure is $9.18 per square foot.

(d) The average cost of the street work is $1.18 per square foot.

(e) If the elevated roadway were carried on a viaduct the entire distance, the project would cost approximately $87,000,000. This means that the placing of the elevated roadway alongside a railroad embankment on a fill will effect a saving of $27,000,000 without placing an additional wall across the city, with its undesirable features.

(f) The average cost of the Wacker Drive Improvement, exclusive of land and buildings, was $13.50 per square foot, and the Michigan Avenue Improvement $20.00 per square foot. The Avondale structure, therefore, will cost only 30 per cent of the Wacker Drive and 20 per cent of the Michigan Avenue Improvement per square foot.

Popularizing Public Play

Effective Publicity for Keeping Local Interest in the Parks and Playgrounds at High Pitch

THE American people have invested in municipal and county park and recreation systems several billions of dollars. Every year notable increases are made to this already stupendous investment. In operation and maintenance several tens of millions of dollars are expected yearly. This capital outlay and this yearly allocation of public funds for operation and maintenance have been and are being made by the people in the hope of preserving certain fundamentals of life, and especially in the hope of securing life more abundant for themselves, their children and their children's children. It is therefore a weighty and grave responsibility that is laid upon park governing authorities and chief executives not only in acquiring, planning, developing and maintaining these properties which represent so large an investment of the people's money, but especially in operation, to the end that the maximum number of people secure the life-giving values for which the investments were made.

It is a curious fact in the history of parks in this country that park governing authorities and executives, except when conducting campaigns for money with which to acquire properties or to develop them have made little use of carefully organized educational publicity in the operation of the properties and facilities entrusted to their care. The prevailing attitude has seemed to be, after the properties have been acquired and developed, "Well, here are the properties and the facilities, the people may come and use them if they wish." As a matter of fact, their real work has just begun. Their supreme function is not to acquire property or to develop it, but to see that the people use the property and facilities. . . .

One of the reasons, no doubt, why more park and recreation departments have not a thoroughly organized division of publicity is in the difficulty in showing the results of publicity, except in terms, perhaps, of increased attendance. In business enterprises the value of any given line of publicity can be measured more or less definitely not only by the volume of sales but also by the increased profits which are the primary object of conducting the business. Those results which represent profits in the operation of park and recreation departments, such as raising the standard of individual and community health, prevention of juvenile and adult delinquency, elevating standards of moral conduct, the development of physical, mental and cultural qualities, increasing happiness, etc., cannot be measured definitely. In time, perhaps, by the use of scientific methods of study and evaluation of the operative processes of park and recreation systems, it may be possible to state in more or less definite terms the actual results of the services on human life, but at best the results will always remain more or less intangible and unmeasurable. However, these considerations should not deter park and recreation authorities from taking a leaf from the primer of the business world. . . .

Publicity Regarding Facilities and Their Location

The ignorance of the average citizen of his own home community is one of the interesting phenomena of community life in America. No park governing authority or chief executive should ever assume that all the people are acquainted with even the location of all the properties under their jurisdiction, to say nothing of the details of the development of these properties and the opportunities offered there for the people's use. Year after year these facts should be brought to the attention of the people through as many avenues of publicity as possible. Some of the means of acquainting the people with these facts may be enumerated as follows:

(a) Compilation and publication of a leaflet or pamphlet, yearly, for free distribution, giving the name, the location and the facilities of each property in the system, together with instructions as to how to reach the property, if of general community use.— Facts concerning distinguishing characteristics as to plant life, geological formations and fine views might be included, as well as information regarding any organized recreations which may be conducted, and at what seasons and hours. Following the general list of properties and facilities a part of the leaflet or pamphlet might well be given to a compilation of similar features or facilities. Thus all baseball diamonds and their locations might be in one table, all tennis courts in another, bathing places in another, picnic places in another, and distinguishing groups or display of plant life and good places for the observation and study of bird life in other tables. Such information would facilitate the location by those interested in particular features. A small map of the park and recreation sites should be included in the pamphlet.

An attempt should be made to get these pamphlets into as many homes as possible. This could be fairly effectively accomplished by systematic distribution through the schools; by sending them out, if not too large, in the monthly bill envelopes of the water department; by distributing them through the playgrounds and other places where people congregate throughout the park and recreation system; by play leaders when visiting the homes of the people in the vicinity of their playgrounds. No doubt the local press would print large sections of such a publication, thus giving the information wide circulation. Such information, or part of it, might be published through chamber of commerce bulletins and general city guides such as are found in the larger cities and often

The Principles, Aims and Methods Involved

Educational publicity is of great importance to park and recreation administration from four different points of view:

1. In establishing a system and in securing funds for acquisition and development of properties.

2. In educating the people as to where the properties are and what facilities and general opportunities they will find there for their recreation, instruction and entertainment.

3. In educating the people in the use of the properties and facilities so that they individually will receive the greatest benefit from them and will still leave the properties and facilities in good condition for the use of others.

4. In acquainting the people of other recreational resources of the community and in the vicinity of the community other than those directly under the control of the department itself.

The discussion of these at some length in the accompanying articles constitutes an authoritative statement of principles governing public park and recreation publicity, including its aims, scope, and methods. The article is Chapter XIX of "Parks: A Manual of Municipal and County Parks" (A. S. Barnes and Company, 1928), a substantial two-volume work based upon a national survey by the Playground and Recreation Association of America in cooperation with the American Institute of Park Executives. It was edited by L. H. Weir, Director of the Study, and has a foreword by President Coolidge. For a review of the book, see page 169 of this issue.

in the smaller ones. Municipal directories might include much of the information. Some municipalities publish a municipal paper through the columns of which all of the information might be issued. Only a very few park systems issue such condensed leaflets or pamphlets of information.

(*b*) *Talks and lectures.*—In nearly every community there are organized clubs and groups, most of which have some kind of instructional program during the year. The chief executive and subordinate officials will in all probability be called upon to give talks from time to time concerning the park and recreation system before many of these organizations, or places on the programs can usually be easily arranged by the office of the department or by the publicity director if there is such an employee. As a form of publicity this is not especially effective from the viewpoint of the numbers of people reached, although a much wider audience may be reached through the press reports of the meetings. This form of publicity can be made, however, rather widespread and effective if definitely organized and promoted. It does reach a considerable number of people who are thinking of community problems and trying to do things in the community. . . .

The department should be supplied with stereopticon machines and sets of slides for use in making popular instructional talks. A portable moving picture outfit would be found invaluable.

(*c*) *Personal visits.*—In connection with the opening of a playground or a neighborhood playfield-park or a community center, one of the most effective means of publicity is to send out, a few days before the opening, the workers who are to be in charge of the particular playground, park or center, to visit among the people residing in the vicinity. The workers would give the families first-hand information of what is going to take place, the hours each day the playground, park or center will be open, the facilities to be found there, and the activities to be conducted. This is not only effective publicity, but also the best possible preliminary work in the management of the property and in the organization and conduct of the activities there. It gives the workers a knowledge of neighborhood conditions that will be invaluable in the organization and conduct of the program, and if they make a good impression on the parents they will the more readily send their children and attend themselves.

(*d*) *Special announcements, placards, posters.*—These or similar forms of publicity are used quite extensively in many park and recreation systems in connection with organized activities. A few examples are:

Band Concerts.—Preliminary to the opening of a series of band concerts a special announcement containing the schedule of concerts for the season, giving name of band, the date, place and hour of each concert, may be printed and widely distributed through such means as those mentioned under (*a*). The press would in all probability print the entire schedule. For each concert a special program announcement may be published and distributed among the audience. This might have on the reverse side a list of all the concerts for the season.

Opening of a New Playground.—Preliminary to the opening of a new playground a poster or placard might be issued announcing the date of the opening, hours to be open, list of facilities there, and a statement of the activities to be conducted. These, posted at conspicuous places about the neighborhood, are effective means of publicity for this kind of event. A similar form of publicity may be used in connection with the opening of a swimming center, a gymnasium, or a new community building, boating center, golf course, etc. The poster or placard is the standard form of advertising tournaments, play festivals, athletic meets, swimming meets, field days, dramatic performances and municipal camps. Where a set of facilities are operated seasonally, a common form of publicity is the issuance of a poster giving a list of the facilities, the location of each, the date of opening of each, and the hours they will be operated, together with the schedule of charges if charges are made. A special announcement in the form of a leaflet giving the same sort of information is sometimes used in this connection.

(*e*) *Parades, demonstrations.* — In cities where a great deal of interest has been aroused in some particular sport or several different sports, a downtown parade of all the players that have entered the contest or contests for the season not only creates a great deal of enthusiasm among the players but also arouses a great deal of public interest. In some instances the mayor has issued a special proclamation concerning the opening of the season and declared a half-holiday. A parade of several hundred to a thousand or more baseball players, of several hundreds of tennis players and golf players, each with the appropriate emblem of his sport, is a sight long to be remembered and does without doubt inspire large numbers of other eligibles to enter the activities. Each great festival day or holiday is an opportunity for a public demonstration of great publicity value, as are the various play days, meets, tournaments.

(*f*) *Pictorial, handcraft and other types of exhibits.*—It is usually very easy to secure the co-operation of the proprietor or manager of large business establishments downtown in setting up in a large show window a floral display, a pictorial display or an exhibit of handicraft work or a display of trophies, etc. Some of the firms are also very much pleased to use publicity material concerning the park and recreation system in their newspaper advertising. Exhibits of this character at local fairs, health shows and other public places and affairs are also effective means of publicity.

(*g*) *The press.*—Of all the forms of publicity, direct or indirect, the most far-reaching and perhaps the most effective is to be had through the daily and weekly press of the community. Few public service departments have more material for news items, human interest stories, and special feature stories or a possible wider range of pictures desired by newspapers than does a park and recreation department. It is through the medium of the press that most of the publicity is secured by park and recreation departments in America today. Nearly all other avenues of publicity feed directly into this and multiply their effectiveness a hundredfold.

It is not commonly recognized, but the owners, managers or editors of a very large number of newspapers throughout the country not only print news, and feature stories, concerning public park and recreation activities, but also play an important role in actively promoting desirable recreational activities, while at the same time giving an enormous amount of space to publicity concerning the particular activity or activities. Examples in point are zoological and botanical identification contests such as those conducted by the Park and Recreation Department of Dallas, Texas, which is actively aided by the local press; the promotion of marble tournaments in several cities; of handcraft activities through bird-box construction and pushmobile contests, and of athletic leagues and tournaments.

(*h*) *Publication of bulletin-newspaper, whether in mimeographed or in printed form.*—In the larger systems, and especially in these systems where an extensive program of recreation is carried on, a weekly or monthly bulletin is very effective, not only in keeping a selected list of citizens informed as to what is going on, but in serving as the medium for acquainting each division of the department of the activities of the others, thereby keeping alive *esprit de corps* by personal mention of the achievements of different staff members in the several divisions. Such a publication might carry new items regarding the programs of park systems in other cities.

The Commissioner of Parks of the borough of the Bronx, New York City, issues such a publication usually in magazine form and believes that the slight cost involved for such a publicity medium is money well invested.

A similar type of publication edited

from the point of view of the users of the facilities in the parks is valuable both as publicity and as a means of stimulating interest among the patrons. The preparation of material and the editing and distributing of the paper have high recreational-educational value as a form of activity. The newspaper prepared by the boys and girls who use the facilities of the Evanston, Ill., recreation system has aroused nation-wide interest among park and recreation officials.

(*i*) *Publication of annual report.*—It is greatly to be regretted that every park department in the United States does not issue a printed annual report, not so much because of its value as local publicity, although important as such if judiciously distributed, but because it makes readily available a current history by years of the department and facilitates exchange of information among park departments in various cities. Because of the wave of economy during the war, and continued since that time to a greater or less degree, many park departments which formerly issued excellent reports no longer do so. It is strongly recommended that every park department which can possibly squeeze money enough from its budget to print an annual report, issue one.

(*j*) *Signs.*—The securing of publicity through signs is universally practiced to a more or less extensive degree by park departments. The type of signs thought of in this connection include direction signs showing the way to leading areas or the facilities of the system, name-signs at main entrances to areas, direction signs within areas, along driveways and walks, signs which give positive instructional information, such as labels on trees or on boards at flower-beds or groups of shrubbery, and names of specimens in the zoo. There is a type of sign, however, which has a directing-restraining intent and is closely related to the policing of the area.

(*k*) *Bulletin board.* — The bulletin board is a fundamental necessity in connection with all types of active recreation areas. It is in a certain sense an immobile news sheet and will be in constant use during the active season for announcements, posting of rules and regulations and standings of organized teams and of players in tournaments, and for many other purposes.

(*l*) *Publicity by word of mouth as a result of the merit of services rendered.* —While all the forms of publicity mentioned are important, in the last analysis the best publicity is the worth of the services rendered by the department and the resultant personal commendations that people make to one another about the services. When a parent is moved to say, "My children attended such and such a playground and it has been a real education for them"; or when one young person says to another, "I had a glorious time at such and such a bathing center"; or "I spent two weeks at the municipal camp. It is is a wonderful place"; or one citizen remarks, "The flower show of the park department was an inspiration"; or "The municipal golf course is in fine condition and the management excellent"—the department is not only securing the most worth-while publicity but at the same time receiving the highest praise that can be bestowed upon its efforts.

Suggestions for Newspaper Publicity

Study each paper carefully to determine its policy and style.

Play no favorites. If a story breaks in the morning, give it to the afternoon paper. If it breaks late in the afternoon, give it to the morning paper. Learn when your editor wants his news and get it to him before that hour.

Newspapers have collected an audience for their own purpose, and contributed material must meet the test of serving that purpose.

In your first paragraph, give an answer to the following questions: What? Why? When? How? Where? Who?

Avoid technical terms or the special phrases of your own organization.

Be concrete and simple.

Prepare your copy in accordance with newspaper practice. Typewrite it or write it legibly; leave plenty of space at top of sheet for head; write on one side of sheet only; double or triple space all typed copy; fold copy twice, do not roll it; spell correctly; get names correctly with all initials.

Study the way newspapers rewrite your own material.

Newspapers prefer to write their own headlines.

True human interest stories are glittering gems in the drab setting of routine news that floods newspaper offices.

Many departments of the newspaper can give you publicity—news columns, cartoons, editorials, advertising columns, woman's page, sports page, letter columns.

Photographs for newspaper publication must have animation, simplicity of composition and the appearance of truth—that is, the picture must actually portray what the caption describes.

Newspapers appreciate any courtesy shown to them or their reporters.

The newspaper is a business enterprise.

Education in the Use of Parks

Most forms of publicity directed at the education of the people in the use of parks and recreation facilities, to the end that the plants and structural features will not be injured beyond what is to be reasonably expected from usage, are in reality a constructive form of police organization and management and might well be included in the chapter on "Park Policing." Such publicity, however, is so intimately connected with those forms designed to encourage the use of recreation areas that they belong better in this chapter. The objectives of the two classes of publicity are in some respects diametrically opposed, the former being intended to acquaint the people with what they have and encourage them to make use of their properties, while the latter is intended to teach them restraint in this use.

(*a*) *Signs.*—The simplest form of publicity teaching restraint is by signs—a type of publicity which was banned about fifteen or twenty years ago largely because it was conducted in purely commandatory and prohibitory terms and because it stood for an actual prohibition of the use of park areas by the people. In this day of positive encouragement of people to use all the different types of park and recreation areas, a judicious use of attractive signs, more from the viewpoint of instruction rather than that of prohibition, may very well be practiced, although such signs are a very difficult problem if they are at all conspicuous, and they must necessarily be thoroughly conspicuous if they are to be seen. Such signs may use only the single word "Please" attractively painted on a small board mounted on a low stake in a lawn or flower bed or shrubbery. It is a hardened offender indeed who can resist obedience to this implicitly courteous appeal. Or the sign may carry a simple appeal such as: "Please do not pick the flowers; other may like to see them, too." Or, "This park is for your use and enjoyment. Help us to keep it attractive so that others may find happiness in its use, too." It is good psychology to word all such signs in courteous language, even though the mailed hand is behind them.

Signs may consist of copies of rules and regulations adopted by the governing authorities for the guidance of the people in the use of facilities. These may be excerpts from general rules and regulations or they may be specific directions regarding the use of play equipment, tennis courts, swimming places, golf courses and other facilities. Such rules and regulations may be printed on cloth or heavy cardboard and tacked onto boards made expressly for the purpose, or printed on a board or sheet metal. The latter is the more desirable and satisfactory, for the former may become faded and easily torn. In some instances a bulletin board or sign case may be expressly constructed with a glass door, the better to protect the sign from weather and possible destruction.

(*b*) *Rules and regulations.*—Educational publicity by signs is an indirect method of educating people. It is not likely to prove very effective unless it

is supplemented by more direct word-of-mouth educational publicity.

One of the most difficult problems that any chief executive faces is to inculcate in the people a sense of proprietorship in public recreation areas which will lead to their use without abuse. . . .

Police or guards have been the main reliance in parks for the restraint of the people in their destructive or disorderly tendencies, and if properly trained they will in all probability always be increasingly important agents, not only in the restraint, of the people, but particularly in their instruction. Instruction of the people, however, should be conceived and handled upon a much broader basis. It should begin in the schools with children and from that point be carried before every organized group that can possibly be reached in a community. A plan of this kind will require in the first place the cooperative help of the superintendent of the schools and the teachers. The school superintendent and the chief park executive might formulate a simple lesson in conduct for the children in relation to the care which they should exercise toward plants and all other natural living things in parks and toward the care of the properties therein For the upper grades and the high schools this could be used as a part of the instruction in community civics. From time to time the park department might provide some one accustomed to talking before children to speak briefly at general assemblies or before classes. In the courses in nature study as followed in classrooms and in excursions to the park, the teachers can even more directly and pointedly inculcate the desired principles of conduct. If some such instruction as this were followed year after year, there would without doubt come about a very marked change for the better with respect to the attitude of the people toward the care of their recreation areas.

The campaign, however, should be carried further than the schools. The preservation of the beauties and works of nature and the proper use and preservation of man-made facilities designed for the upbuilding of health, strength and character through joy in life, should appeal to every religious and ethical leader in the community. Churches use parks for picnics, and active recreation areas for athletic activities. It is fitting, therefore, for the ministers to give some definite, pointed instruction to the children and young people of a Sunday school, to the members of the young people's society and to his congregation regarding their conduct in relation to the care of properties in parks, provided for their use.

Organization for Educational Publicity

In the great majority of park systems the duty of organizing and conducting educational publicity is likely to fall upon the chief executive himself, for the reason that the larger number of such systems are in communities of relatively small population where the general organization of the department is not highly departmentalized. At the present time, even in the larger communities with park departments having several functional divisions and different types of specialists, the chief executive usually assumes the role of educational publicist for such publicity as is secured. This is chiefly because this fundamental duty has not been given the position its importance warrants among the functional services of the department, and consequently no definite organization has been perfected for carrying it on.

General Principles in Publicity

Accuracy is of fundamental importance. Do not exaggerate.

Publicity should be educational. Just to be known, even widely, is not enough.

Reiterated impact is an important principle.

Good publicity is measured by the amount that sticks in the mind.

Attempt only those things which can be done effectively.

Express appreciation of individuals and organizations who help.

Keep yourself, as director, in the background.

Appeal to civic pride. Hammer hard at home-town stuff.

Do not promise the public too much.

Appeal to curiosity.

Get personally acquainted with the editor. Make a point of thanking him for any publicity given by his paper.

In all such instances the chief executive must of necessity appear personally before different groups to give talks and addresses, must prepare copy for the press, take pictures, or have them taken, to illustrate human interest features, prepare bulletins, pamphlets and annual reports, take responsibility for the preparation and posting of signs, and give out information. But in carrying on all these possible lines of publicity every member of the executive staff should give personal assistance. Thus the playground supervisor should keep the executive informed of interesting happenings on the playground and of special events, and may often prepare the copy for such material; the secretary will give out information upon calls from citizens; the director of the conservatory and the head gardener will keep him informed regarding the time when floral displays will be at their best and most likely to be enjoyed by the people; the director of the zoo will tell him of any unusual happening which may be of special public interest, and other department heads will inform him of events in their departments. The reporter for the local press will no doubt be of much assistance in the actual preparation of copy for the press if given the information.

In a number of systems some particular member of the staff, especially one who may have had newspaper experience or who has a talent for publicity, is designated to handle the publicity in connection with his other duties.

In the larger and more highly developed park system such a method of organizing and carrying on publicity is more or less a makeshift. Publicity is today a distinct profession, just as forestry, landscape gardening and the conduct of organized recreation are professions. It should have a definite divisional position in the department with a director of educational publicity in charge. Where there are two departments in a community—a park department and a recreation department—the employment of such a director might conceivably be a joint project. While it is desirable that such a director be skilled in newspaper technique, more than this should be required, for his real function is to educate the community in the values of recreation and the special opportunities afforded for recreation by the department and by other agencies in the community, and in the use of the facilities offered. In a sense he must combine the functions of an expert investigator and interpreter of community institutions and recreational needs with that of the educational publicist.

Duties of the Educational Publicity Director

1. A publicity director should keep himself intimately informed of the details of the activities of every division of the park department. Workers on the firing line engrossed in the details of organizing and conducting their divisions are not always conscious of the news value of the things they are doing, nor do they often have the time to interpret what they are doing even if they are conscious of the interest of their program to the public.

2. He should be thoroughly conversant with every agency and institution in the community making a contribution to the city's recreational life, studying the work of these institutions to see how their programs may be correlated with the work of the park department. He should be familiar with certain general community conditions relative to juvenile delinquency, health and working conditions and cultural conditions so that he will know better where to put the emphasis in publicity regarding these conditions, if the services of the park department may in any way be made to affect the situation.

3. It should be his responsibility to organize and conduct any or all the

various lines of publicity mentioned and others not specifically outlined.

It is hardly necessary to suggest that the publicity director should keep the chief executive intimately informed of all that he plans to do. Publicity can often do as much harm to a cause as it does good, if it is ill-timed or improperly presented. The chief executive is the ultimate authority as to the character and timeliness of publicity, for upon him rests the entire responsibility for the success of the department.

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A New England Town in the Heart of a New England City

By J. T. WOODRUFF
CONSULTANT TO CITY OF SPRINGFIELD, MASS.

THE large black area shown on the accompanying photograph represents about 3,227 acres in the eastern central part of the city of Springfield, Mass. This territory is largely undeveloped acreage. It is surrounded by proposed park lands, streams, ponds, and lakes, and has many beautiful views over land of varying contour. The soil is sandy, affording good drainage. Main radial traffic arteries are already provided. There are about sixty-five owners of large acreage in the area. All owners of property in the area are banded together in a civic association, with headquarters in an attractive little brick house at the "center." This little house was formerly a school, but is now under the control and maintenance of the Park Department of the city.

A Planning Committee of the Civic Association meets with the City Planning Board in the development of a plan for the area. At present this area is zoned into single-family residences of the same classification as pertains in small spots throughout the built-up portions of the city. These single-family residence areas in the built-up portions have minimum front, side, and rear yard requirements to fit 50 x 100-foot lots. This is reasonable, since the minimum allowable lot in a subdivision is 50 x 100 feet. However, it is proposed to designate the large black area as a special zone in which front, side, and rear yard requirements would be greater and on which the lot size would be enlarged.

This movement has come from within the local Civic Association and petitions are being circulated asking for such adjustment. Open development where adequate space exists is what is wanted. No development pressure exists other than that of growing Springfield, so that it will be possible to maintain such a town type of development. The Planning Board of the city and the Committee of the Civic Association believe that this black area can be made a "New England town" in the heart of a metropolis.

A town plan for the entire area, insulated from other areas by park belts, much as is done in the English garden city plans, is being made cooperatively by the Planning Board and the "Town" Committee. This plan is for about fifteen units of about two hundred acres each and shows streets, parks, schools, sewers, water, fire protection, and a suggested subdivision of the five-square-mile area. Nothing will be done to legalize or force any plan or development on the community. The plan will rise or fall on its appeal to the property-owner. It will be placed in the Community Building, where it will form the background for all local discussion and community activity. If it lives at all, it will be because it is workable and practical, not because it is legally powerful. Through zoning the basic control will be felt. Zoning will keep use of property in control. Local business areas and school sites aggregating about two hundred acres each will be designated. Zoning will provide for greater lot size through greater front, side, and rear yard requirements. The regulations for subdivision may be altered for the "Town" area in order to permit the type of layout most adaptable to the land contour and suitable for the neighborhood unit scheme.

Aside from the existing radials, no new traffic highways will be provided. The horizontal radial is at present a main cut-off route for Boston to New York traffic, and as such should not cut directly through a "town" development. This condition is being remedied by the construction by Massachusetts of a direct trucking route from Worcester to New Haven.

Advantages of this New England town within a metropolis, over the independent individual town development outside Springfield, are chiefly in the economy of municipal service and the ease of transportation to the city center. Before this work was begun, the entire area was zoned in a one- and two-family residence zone; in fact, over 80 per cent of the area of the city was so zoned. Within that general area there was much building of single-family residences. Now it is possible for one desiring to build a single-family residence to receive all the protection through zoning to which he is properly entitled, and live in an open rural neighborhood while reaping the advantages of a high grade of municipal service.

Landscape Art and City Life

"Landscape architecture is primarily a fine art, and as such its most important function is to create beauty in the surroundings of human habitations, and in the broader natural scenery of the country; but it is also concerned with promoting the comfort, convenience and health of urban populations, which have scanty access to natural scenery, and urgently need to have their hurrying work-a-day lives refreshed and calmed by the beautiful and reposeful sights and sounds which Nature, aided by the landscape art, can abundantly provide."

—CHARLES W. ELIOT.

Municipal and School Outdoor Theatres in California

By GEORGE W. BRADEN

WESTERN REPRESENTATIVE OF THE PLAYGROUND AND RECREATION ASSOCIATION OF AMERICA

THE revival of the Greek Theatre abroad and in the United States and the increasing emphasis in producing plays in the out-of-doors has resulted in wide interest in the construction of municipal and school outdoor theatres. The movement, while general throughout the United States, has found its larger expression in California, partly in that the mild climate makes attendance at outdoor theatres possible through the greater part of the year. Among California cities having municipal outdoor theatres are Anaheim, Alhambra, Los Angeles, Oakland, Pasadena, Pomona, Redlands and Richmond. Among schools having outdoor theatres are the University of California at Berkeley, Occidental College in Los Angeles, Pomona College in Claremont, and Santa Monica High School, Santa Monica.

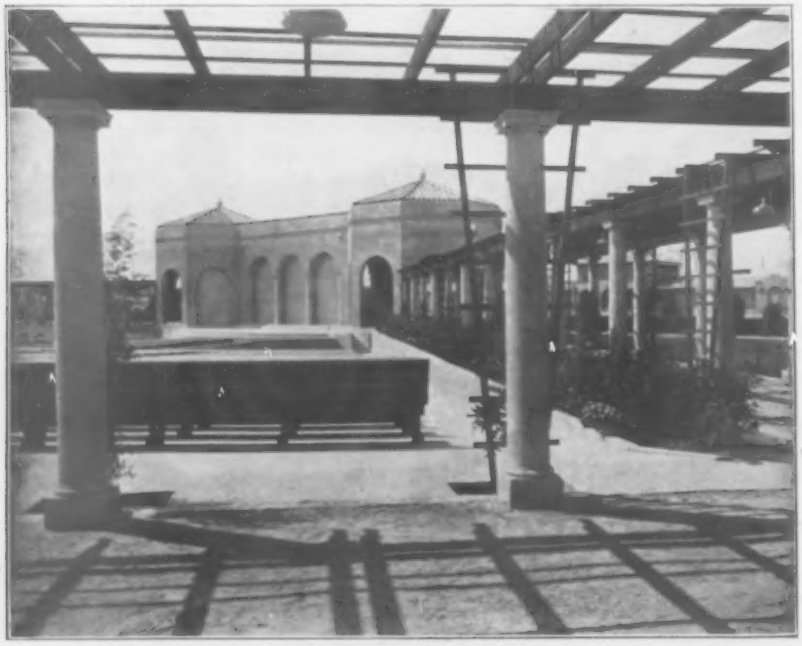
Important factors in the construction of the outdoor theatre are: topography of the site; accessibility; acoustics; relative elevation of seats and stage; contour; arrangement of dressing-rooms and approaches; type of construction; and seating capacity. Material is given here illustrative of several types of outdoor theatres and service ranging in construction cost up to $50,000 and seating capacity up to 5,000. The information presented has been received from the officials, respectively, whose names are given. There is also included a statement of the movable outdoor theatre at Oakland.

Anaheim

MUNICIPAL GREEK THEATRE.—J. W. Price, City Manager.—The theatre is located in the City Park, within four blocks of the center of town. The architectural design followed is Greek, the floor being solid concrete, with retaining walls on the sides. The building is brick with stucco work and a red tile roof. The pergolas are made of concrete and stucco, with wood beams across the top with slats to support vines.

The cost of this building was $41,000, taken from the general fund with no special bond issue. The seating capacity is 2,500. The location, in reference to transportation, is excellent—three main through boulevards, one bordering each side of the park, and the third one block distant. All busses from Los Angeles, San Diego, etc., go by the park. Besides the general street parking, an extra strip runs around the park and will take care of two car widths parked parallel.

The management is under the general supervision of the Park Superintendent. The Park Program Committee has been appointed to help in developing and working out a suitable program. Although not in use until the middle of July of this year, the theatre has already meant a great deal to the people of this community. There have already been 25 meetings held in the park, including union church services, band concerts, musical programs and civic meetings, with an attendance of 28,000.



GREEK THEATRE, ANAHEIM

Berkeley

UNIVERSITY OF CALIFORNIA GREEK THEATRE.—Charles Keeler, Secretary of the Chamber of Commerce.—The Greek Theatre of the University of California, a gift of William Randolph Hearst, is located upon a steep hill slope in the midst of a grove of eucalyptus trees on the campus of the University of California. It is modeled after the classic design of the Theatre Dionysius in Athens, adapted, however, in some respects to modern needs, with a diazoma, and with a raised stage and a lofty wall of concrete broken into panels separated by columns as a background. It seats nearly 7,000, and cost, when built in 1903, $45,000. The theatre is located in a portion of the campus that is not directly served by transportation and, accordingly, those who do not come by automobile must walk a distance of five or six blocks to reach it.

The theatre is used regularly during the summer and autumn months, while college is in session, for Sunday afternoon concerts. Occasional performances of great importance are given in the Greek Theatre. Sarah Bernhardt has twice appeared in "Phædre," and Margaret Anglin has produced several notable Greek tragedies here. Maude Adams gave a performance of "As You Like It," and many other Shakespearean plays have been performed by such distinguished actors as Southern and Marlowe, and others. This autumn the opera "Norma" was produced under the direction of Arturo Casiglia, and a few months ago "The Trojan Women" was given by a company of University actors.

Picturesque football rallies, with huge bonfires, are held in the Greek Theatre before the intercollegiate games, and there is an original extravaganza produced each year during the commencement period.

The Greek Theatre has been a notable factor in the social and cultural development of Berkeley. In 1921 the Berkeley Chamber of Commerce gave a three days' Music Festival here, at which the work of California composers exclusively was rendered. A symphony orchestra and a chorus of 200, with many distinguished soloists, participated. There was also a children's matinee in which some 2,000 Berkeley school children took part. A number of very eminent men have appeared in the Greek Theatre, among them President Theodore Roosevelt and President William H. Taft.

The theatre is managed by a committee, Prof. W. Popper, Chairman, consisting of the following: Prof. C. D. von Neumayer, Prof. D. N. Lehmer, Prof. W. S. Weeks, Prof. W. H. Durham, and Prof. W. R. Dennes.

Hollywood

THE LITTLE LATTICE PLAYHOUSE.—George Hjelte, Superintendent of Recreation.—The Little Lattice Playhouse is the name given to a spot in beautiful Barnsdall Park, an eight-acre tract in the center of Hollywood given by Miss Aline Barnsdall to the city of Los Angeles. The Little Lattice Playhouse is, in fact, misnamed, for it is not a house at all but merely a beautiful shady area in an old olive orchard which has been provided with such minimum facilities as have been proved necessary in the staging of some simple playground dramatic productions.

The picture which accompanies this statement illustrates the simplicity of the construction of this playhouse. As its name implies, the construction is of lattice work and amounts to little more than that which was necessary to define the stage and to cover the approaches to the playhouse. The cost of constructing this playhouse did not exceed $200. The seating capacity of the hill slope which accommodates the audience is about 300.

The playhouse is on a hill slope overlooking part of Hollywood. In the background can be seen the hills of Griffith Park, including the highest peak in this vicinity. Barnsdall Park, in which the playhouse is located, is on three major traffic arteries—Hollywood Boulevard, Vermont Avenue and Sunset Boulevard. It is accessible by local street cars and bus lines from various parts of the city and by interurban trains running between Los Angeles and Santa Monica.

The playhouse is under the management of the Division of Dramatics and Pageantry of the Department of Playground and Recreation of the city of Los Angeles. A weekly matinee is given at which groups of children from different playgrounds each week put on some of the dramatic events which have been worked up on the various playgrounds. Some of the plays given during the summer season are as follows: "Mistress Mary Gives a Garden Party," "The Tree Triumphant," "The Enchanted Garden," "Cinderella," "The Clown of Doodle Doo," etc. No admission is charged and all are welcome to attend these performances.

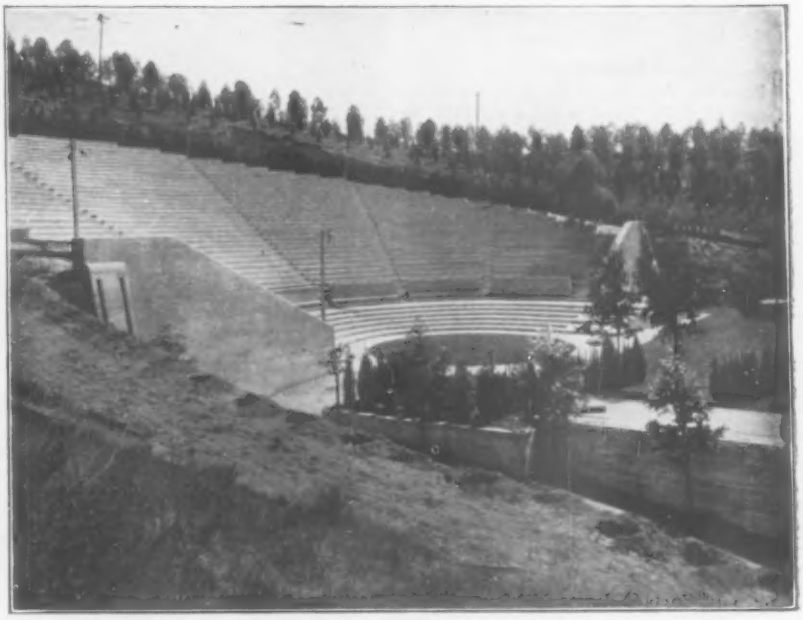
During the summer numerous parents and other visitors, as well as large numbers of children, availed themselves of the invitation to attend these plays. The invitation was expressed on the weekly program in words of Robert Louis Stevenson as follows:

> "Come up here, oh dusty feet,
> Here is Fairy Bread to eat."

Eagle Rock, Los Angeles

OCCIDENTAL COLLEGE HILLSIDE THEATRE.—Arthur G. Coons, Ph.d., Executive Secretary, Occidental College.—The Hillside Theatre of Occidental College is located on the campus of the college, which is situated in the northern suburbs of the city of Los Angeles, near the community of Eagle Rock, and not far from the community of Highland Park, both of which communities are within the corporate limits of the city. It is at a distance of about eight miles from the metropolitan center of Los Angeles, about six miles from Pasadena, four from Glendale, and three from South Pasadena, thus being in the vicinity of several important centers and easily accessible to all. Important boulevards are close at hand.

THE LITTLE LATTICE PLAYHOUSE, LOS ANGELES



OCCIDENTAL COLLEGE HILLSIDE THEATRE, EAGLE ROCK, LOS ANGELES

The Hillside Theatre in the main is Greek in design, but has a raised stage and a circular orchestral pit approached by a stepped ramp. It was erected in 1925. The theatre is not complete as far as plans go, but does not now in any sense present an incomplete appearance, because the wings and rear of the stage have been planted with cypress trees, while eucalyptus trees flank both the stage and the approaches, thus providing a somewhat hidden and picturesque setting. In addition, the entire area immediately surrounding the amphitheatre has been planted to eucalyptus trees, now, after two years of growth, of good size, and serving to set the theatre apart from the rest of the college campus. From the higher seats of the amphitheatre, however, a magnificent panoramic view of a large portion of the Eagle Rock City and York valleys is available, and on the west the Glendale hills close off the last rays of the sinking sun, leaving the spectators at a late afternoon performance free to enjoy the program before darkness falls.

Though incomplete, the present theatre has a seating capacity of approximately 5,000. It is equipped with storage and dressing-rooms beneath the stage on each

side. Its acoustic properties are very good. Excellent lighting facilities for night performances have been provided.

This theatre was constructed and brought to its present condition of usefulness at a cost of $50,000. The sides and foundations of the stage are of concrete, as are also the ramp and steps within the orchestral pit. A circular plot of grass in the pit combines with the grass floor of the stage to give a desirable effect. Behind this pit and behind a protecting wall ascend the rest of the seats, which are constructed of wood.

The management of the theatre is vested in a committee appointed by the college, of which Prof. Charles F. Lindsley, of the Department of Speech Education, is Chairman. All proposed events seeking the use of the theatre must meet with the approval of this committee.

The theatre has been used upon numerous occasions for the presentation of musical programs of excellent character, and for the usual spring and Commencement events of the college. A notable event of the past year was the Easter sunrise service under the auspices of the people of Eagle Rock community.

Claremont

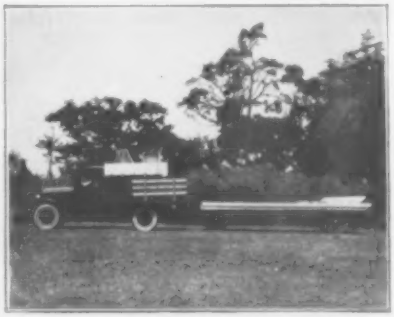
POMONA COLLEGE GREEK THEATRE.—James M. Judy, Head of Publicity Department.—The Pomona College Greek Theatre is located in Blanchard Park, an area of fifty acres on the campus which is being preserved by the College in its natural state. The park is filled with fine specimens of live-oak trees. The theatre was designed by Myron Hunt of Los Angeles. It should be made clear at the outset that it is only just started. Most of the concrete work is permanent, but a large section of wooden benches will be replaced with concrete as soon as funds are provided for that purpose.

The Greek Theatre was built in 1914 at a cost of approximately $7,500 to provide a setting for a three-day pageant celebrating the twenty-fifth anniversary of the founding of the College. Very little in the way of improvements has been possible since that time. Approximately 4,500 can be seated comfortably in the theatre.

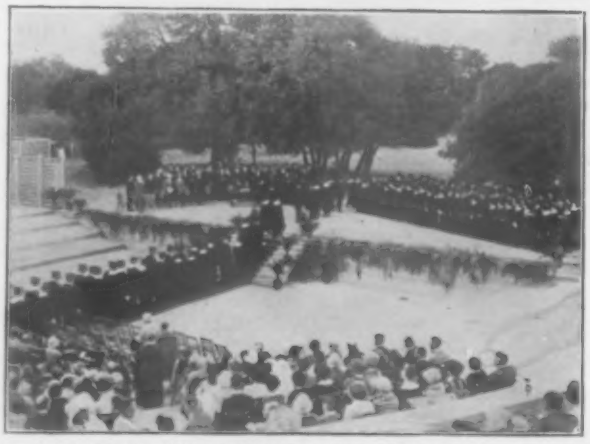
While the theatre is not very accessible at the present time, its location is advantageous in that it is fairly easy to control traffic when necessary. There are several large parking areas within a block of the main entrance. The Pacific Electric and the Santa Fé Railroads run about two blocks from the theatre. However, almost everyone comes by automobile. The theatre is listed as one of the non-productive buildings on the campus and it is managed by the personnel of the Business Office.

The Greek Theatre is used a great deal during the summer months. Monday evening recitals are given each week during Summer School. The important events of the Commencement season, such as the College play or opera, the Baccalaureate sermon and the Commencement exercises, are held there. Occasionally an event of importance is scheduled for the Greek Theatre after the opening of College in the fall, particularly in the late afternoon.

TRAVELING THEATRE IN OPERATION, AT DE FREMERY PLAYGROUND, RECREATION DEPARTMENT, OAKLAND, CALIF.



OAKLAND TRAVELING THEATRE EN ROUTE



TWO VIEWS OF GREEK THEATRE, POMONA COLLEGE, CLAREMONT, CALIF.
The upper view shows the natural stage at the right, with live-oak trees and the Sierras in the background. The lower one pictures commencement exercises held in the theatre

Oakland

OUTDOOR TRAVELING THEATRE.—Raymond W. Robertson, Superintendent of Recreation.—During the early part of the summer the Oakland Recreation Department purchased an ordinary truck-trailer and upon this foundation constructed their first Traveling Theatre, the total cost of which did not exceed $150. Its folding platform, when extended to full length, makes a stage 12 feet wide and 18 feet long. When ready for travel it is just half as wide, or the width of the truck platform. It is so constructed that the extension is easily handled and sets up in an almost automatic manner. The attractive stage settings and furniture are of a folding type which can be set up in a very few minutes, and when a group of plays is finished, it is not long before each piece is in its correct place and the stage is on its way to the next playground, where another crowd of children eagerly awaits its coming.

The stage setting consists of five two-fold screens, each section of which measures 4 by 7 feet, and is hinged with double-action hinges. Stages of many shapes and types, with interior or exterior scenes, are set up to suit the action. Frequently the setting consists of only a tree, a vine-covered fence, a fireplace and a window, or a cupboard, benches and stool. About the base of the stage, which is 32 inches from the ground, is draped a bright awning, which harmonizes with the stage-set in color and design.

If educational dramatics means widespread participation in plays, pantomimes and story plays on the part of children, if it means an ever growing appreciation of the best in drama and art standards, this traveling theatre, "The Vagabond," is helping to further this movement.

Miniature Flying Field

YOUNG Los Angeles hero worshippers of Colonel Lindbergh may be expected to be perfectly happy now that the Playground and Recreation Department of that city has made special provisions for their flying experiments. According to recent announcements, Hawley Athletic Field has been selected for the development of an airport for miniature aircraft. The field house is to be enlarged to provide working space, and all necessary equipment provided. This equipment will include wind direction instruments, instruments for testing the velocity of the wind, and take-off equipment.

Landscape Composition in Modern Cemetery Design

By A. D. TAYLOR
LANDSCAPE ARCHITECT, CLEVELAND, OHIO

WHAT is a modern cemetery? It should not be, as some believe, a mere "city of the dead," but rather a place of quiet and of worship; a place into which one may go, surrounded by the proper atmosphere, to remember the dead. The very air we breathe there, and the pictures, created by art and nature combined, which surround us there, should inspire a solemn tribute to the dead.

A modern cemetery should provide seclusion, an atmosphere of dignity in striking contrast to the modern idea of living. It should be a definite expression of a sincerity of religious purpose, without over-emphasis in that direction. It should be a spot of hallowed ground serving equally the living and the dead. It should, above all, be a scenic asset to the community. The feeling we should have when visiting the properly designed cemetery is the feeling we should have in a cathedral whose beauty and peace, unaided by music or words, seem to become a part of us.

A cathedral, a railroad station, and a public auditorium are all semi-public buildings, but they differ primarily in their design. There should be, however, something in every one of these buildings which causes one upon entering it to feel intuitively the purpose for which it has been created. Good landscape composition in a cemetery arouses such a reaction.

A landscape composition is a rather intangible thing. It is a work of art, and the person who assumes the responsibility for creating it must be certain that he has the technique and the ability to so do his work that others will feel what he has felt and has sought to express in terms of cemetery design. The man who casually decides that it would be a good idea to introduce some landscape composition into his cemetery design without having studied and absorbed the artistic principles controlling landscape composition will be about as successful in his ultimate achievement as a journeyman builder would be in introducing the elements of cathedral architecture into a church building.

THE CREATION OF PROPER SETTINGS FOR INDIVIDUAL MONUMENTS AND THE ARRANGEMENTS OF NUMEROUS SUCCESSIONS OF "PICTURE GROUPS" ARE TWO RESULTS OF EFFECTIVE LANDSCAPE DESIGN AS ACHIEVED BY THE LAKEVIEW CEMETERY ASSOCIATION IN CLEVELAND, AND NOTED BY MR. TAYLOR

The Plan on Paper and the Plan as Applied

There are two steps in landscape composition as applied to cemetery design. The first is the plan on paper; the other is the plan applied to the cemetery. We have been in cemeteries where we have received the impression of a waffle-iron imprint pattern with some monuments dropped around here and there and a few trees thrown in for good measure. We have been in others where there was a strong feeling of harmony in the design. Landscape composition in a cemetery includes all the difference between a cemetery which contains only the maximum number of lots per acre, provided with some means of access to each lot, and the cemetery which brings into your consciousness a something which you cannot define—one in which you feel that you and God and those gone before you are in close communion.

But such an effect, with no false note sensed anywhere, is not casually created. The physical elements which combine to produce it are not difficult to analyze. Let us consider some of the most outstanding of these. They are: the natural site; the grading problem (which the landscape architect must have the skill to solve in a natural as well as an efficient manner); the proper location and widths of roads and walks, which, while serving as arterial traffic ways, strike an important note in design; the monuments and headstones; the location and type of buildings; the development of adequate and attractive lawn areas; and the selection and proper planting of flowers, shrubs, and trees.

There are two extreme schools of

cemetery design. One holds that the cemetery may be a gridironed field patterned with monuments. The other holds that it should be practically free from monuments, therefore virtually a park. Neither school appeals to the majority as essentially correct, but we may recognize and respect a middle course between them and, by doing the things which I have stressed, may create landscape composition in a way to make of the cemetery a series of interesting pictures. Such pictures should have dignity. They should have character. Above all, they should have a great degree of permanence. They should avoid false notes, such as varigated foliage and other horticultural novelties. Such pictures should be arranged in orderly sequence, and should afford variety and interest. If our cemetery be an old one, we can profitably study it with these things in mind.

A Cleveland Example

Lake View Cemetery in Cleveland affords two of the best examples I have seen of the successful management of cemetery design detail. The first is that of excluding from the cemetery picture those disturbing elements arising from bordering commercial and residential areas. The second is the proper use of planting to create a set of pictures, such as I have already referred to, interesting and varied in character and in which monuments of different character are given appropriate backgrounds.

Improving Old Cemeteries

We often find that in an old cemetery there is little opportunity to make great improvements. There is small space for planting. Roads and walks have been laid out in rectangular lines. Monuments are of conventional design, and crowded together. Such cemeteries, especially if in rural settings, may be, with adequate expenditure of money and time, made into places of positive inspiration for the entire countryside.

The addition of a well-designed entrance; the development of interesting walls and fences; the proper location of planting in spots where planting may be placed; the creation of a frame of foliage for the entire area, perhaps possible only through the acquisition of a bordering strip of property; the carrying of a theme of foliage or flowers throughout the cemetery at different periods in the year; all of these elements combined may unite the piecemeal planning into a harmonious whole and subordinate the unsightly monument here, the poorly planned grading there.

In the case of a great cemetery such as Lake View or Mt. Albans, I believe there is but one thing to do, and that is to establish masses of planting that create a proper and interesting background for monumental work. Such an expedient permits each monument to be seen at the best advantage without being subjected to competition with other monuments or strong features in the landscape.

Layout of Cemetery Roads and Lots

The layout of roads in cemeteries is important. The designer must always keep in mind that he is not dealing with roadways through a subdivision or a pleasure park. Roads in a cemetery should have a texture of surface that contributes at all times to the quiet, rustic simplicity that should pervade the entire area. They should lead circuitously here and there through the cemetery, except in the case of two or three of the more important passageways through the grounds.

As to the layout of lots—I have seen cemetery plans of an important character undertaken by men who assumed to know cemetery design, where apparently the sole purpose was to crowd in the maximum number of lots with little thought for future appearances. A land-

ONE OF THE MANY BEAUTIFUL VISTAS CREATED BY THE SCIENTIFIC USE OF LANDSCAPE DESIGN IN WOODLAWN CEMETERY, TOLEDO, OHIO

THE IMPORTANCE OF INFORMAL, WINDING ROADWAYS IN THE CEMETERY LANDSCAPE IS ILLUSTRATED IN THE TREATMENT OF FOREST HILL CEMETERY, MEMPHIS, TENN.

scape architect who accepts the obligation to lay out a cemetery which is to incorporate into its design the proper landscape composition, should have assistance at the very beginning from the most competent cemetery expert available. The design must be a happy solution of the problems of efficiency and operation, of maintenance and of real landscape composition.

It is one problem to develop landscape compositions successfully. It is an equally important problem to preserve them. There is only one way to do the latter. That is through perpetual and continuous care. Nothing changes so rapidly as landscape composition. Nothing else is so fugitive. There is nothing else which is capable of being damaged so much through ignorance and neglect in so short a time.

EDITORIAL NOTE.—This article is based upon an address delivered by the author before the National Convention of Cemetery Superintendents in Cleveland, recently.

Accident Prevention: A Feature of the Community Health Program

THE developing science of traffic control has entailed much discussion of what department or combined departments of the city's affairs should assume responsibility for public safety in the streets. Until recently little thought has been given to the health department responsibility in this connection, but the idea seems destined to take on importance in cities everywhere, since accident prevention now appears so logically a part of any program designed to reduce preventable deaths and the causes of disability as well as illness.

This was the point of view of the Bellevue-Yorkville Health Demonstration, of New York City, in undertaking recently a survey of street accidents in its district. The district is one of the most densely populated parts of Manhattan. Its residential population is 159,150 persons, and during the day this is vastly increased by business and working people, shoppers and visitors, which means that it has all the typical problems of the average congested city district and a whole group of problems distinctive to itself.

The purposes and the methods of this survey, and the conclusions resulting therefrom, as reported by Godias J. Drolet and Laura W. Nathan, are set forth in a 22-page multigraphed booklet from the summary of which the following quotations have been taken:

"In six months alone, from January 1 to June 1, 1927, 1,852 street accidents occurred in Bellevue-Yorkville; 1,575 persons were injured, and of these injuries 23 were fatal.

"Sixty-nine per cent of the injured were hurt by 'autos,' 3 per cent by street cars, and 18 per cent in collisions.

"The annual rate for fatal accidents is twice as high in Bellevue-Yorkville as the average for New York City as a whole. Commercial 'autos' caused more deaths than 'other autos.' Forty-six per cent of the fatalities were among school children, and 25 per cent among middle-aged men and women.

"From 1,350 individual cases studied it is seen that 20 per cent of street accidents occur among children under sixteen; twice as many boys as girls being victims. Among persons more than twenty-five years of age there are about twice as many men as women injured. Prevention of street accidents must concern itself mainly with boys and men.

"Three hundred eleven individual records were studied for details of causes of street accidents, time of occurrence, type of vehicle, and residence of injured. In automobile accidents, pedestrians seem to have been responsible for their injuries twice as frequently as motorists or cars were at fault. 'Jaywalking' was the most frequent cause of street accidents; crossing 'against the lights' next. Many children were hurt through not crossing at proper places or through 'hitching' or 'getting rides.' The need for more playgrounds is indicated by the fact that running or playing in the street was responsible for one-quarter of the accidents to children."

The report indicates the principal danger-spots of the district, and, in conclusion, makes the general recommendation that there be additional traffic lights, more traffic men, safety isles or markings, stricter traffic law enforcement, play places for children, and appropriate, continuous educational work — recommendations reached through Police Department cooperation.

The Lighting of Airports

A Brief Exposition from a Cooperative Report of Four Specialists

RAPID progress has been made in this country in lighting and otherwise equipping airways, particularly air-mail routes. The Department of Commerce has been actively carrying this work forward, placing the United States in the front rank in this respect. But neither the Department of Commerce nor any other part of the National Government undertakes the establishment and maintenance of airports, this responsibility being left to the localities involved. Municipalities are being urged to provide airports, either from public or from private funds, in order that a coordinated system of facilities for air transport may result.

Inasmuch as an adequate use of this relatively new and rapidly developing form of transportation involves night flying to a considerable extent,—which may be expected to increase as intensive use of airports becomes necessary,—the problem of airport lighting has become important. The Illuminating Engineering Society is one organization that concerns itself with this subject, and in its *Transactions* it has published a number of papers and reports dealing with the lighting of airways, airports and airplanes. At its last convention there was presented a paper on "The Present Status of Aeronautical Lighting in the United States," representing the cooperative efforts of four specialists: Preston R. Bassett, of the Research Department, Sperry Gyroscope Co., Brooklyn, N. Y.; R. W. Cost, Commercial Engineer on Aviation Lighting, Westinghouse Lamp Co., Bloomfield, N. J.; E. A. Leinroth, Aviation Lighting Engineer, B. B. T. Corporation of America, Philadelphia, Pa.; and H. C. Ritchie, Aviation Lighting Specialist, General Electric Co., Schenectady, N. Y.

In respect to airport lighting the following excerpts from the paper constitute a brief outline:

For the purposes of marking the landing field and providing as much information as possible regarding air and ground conditions to the approaching pilot during the dark hours of the day or at night, a modern airport employs the following lighting equipment:

Beacons.—As many of the landing fields are in close proximity to cities, it is essential that pilots have facilities for readily locating the landing areas without confusion during hours of the day and after nightfall.

Boundary, Appoach and Obstruction Lights.—The border of the landing field is outlined with lamps, commonly known as "boundary lights," spaced at 200- to 300-foot intervals. Weatherproof units equipped with plain or prismatic glass globes, permitting the use of either series or multiple Mazda lamps, are illustrated herewith. Several standard types of moisture-proof junction boxes are available, for connecting the lights to the underground cable feeders.

When high potential alternating current, such as 2,300 volts, is available, the series system, operating through a constant current transformer, is generally used.

Favorable points of approach to the field are usually marked by a section of one or two green lights (commonly referred to as "approach lights") on the border. Where this distinction is desirable, the units are equipped with green glass globes.

All obstructions on or near the landing field, such as pole lines, buildings and trees, should be surmounted with obstruction lights, each unit of which is equipped with a ruby glass globe. The obstruction light should be mounted at a sufficient height so that it will be visible from all sides of the obstruction.

Major obstructions such as radio towers, water-tanks and high smokestacks near a landing area should be surmounted with obstruction lights, and the Department of Commerce has rather recently recommended that these lights be placed on a flashing circuit with 60 to 100 flashes per minute.

Hangar Lights.—To assist the aviator

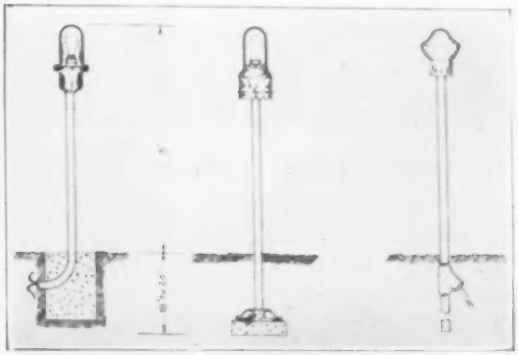
Courtesy General Electric Co.

LIGHTING THE AIRPORT

A painting showing the use of boundary lights, approach lights, obstruction lights, ceiling indicator, revolving beacon, and flood lights

Some Methods of Airport Lighting

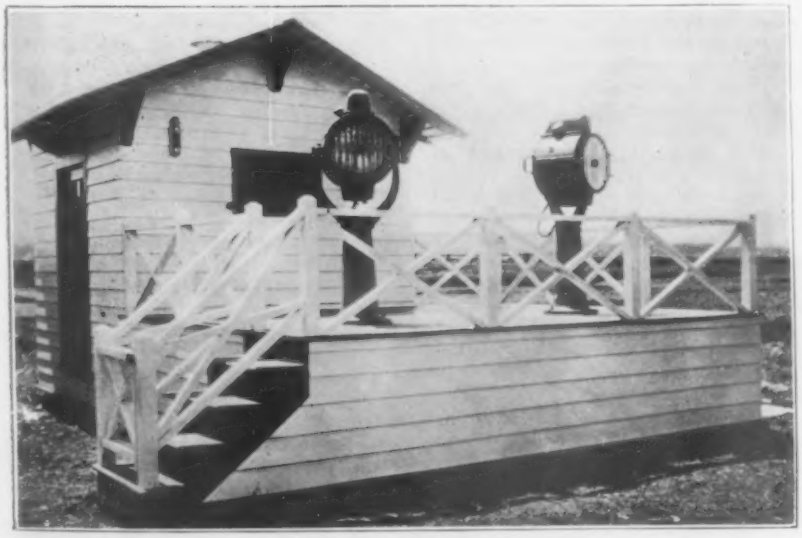
24-INCH GENERAL ELECTRIC BEACON FOR AIRWAY AND AIRPORT USE



BOUNDARY LIGHT (WHITE) APPROACH LIGHT (GREEN) OBSTRUCTION LIGHT (RED)

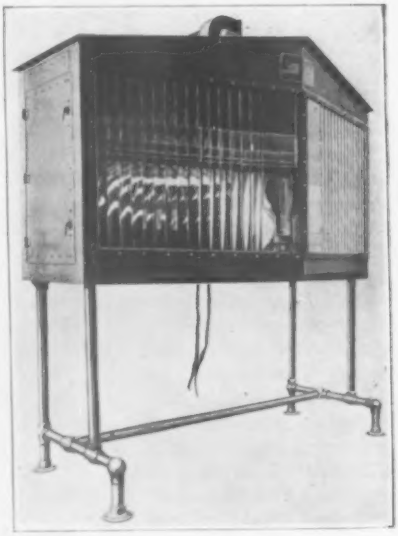
SPERRY INCANDESCENT CEILING LIGHT WITH PARABOLIC REFLECTOR

ILLUMINATION OF HANGARS AT CLEVELAND AIRPORT
Showing floodlighting of roofs and sides of hangars, and illuminated wind cone

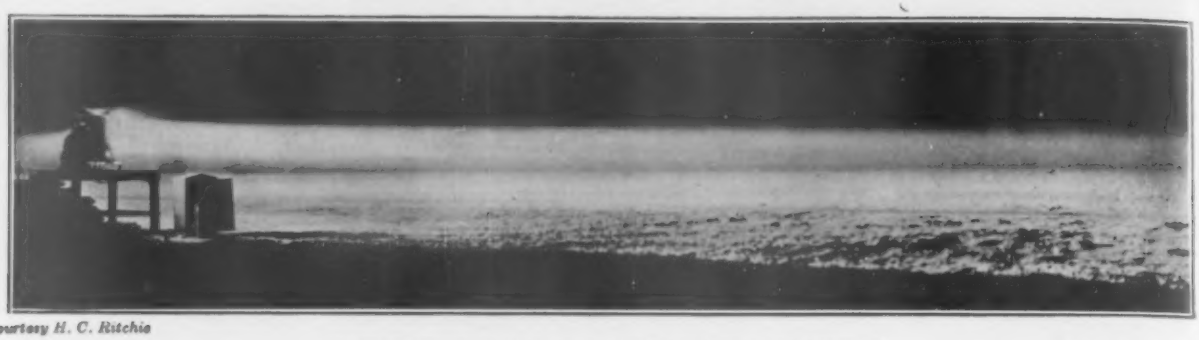


Photographs on this page courtesy H. C. Ritchie and General Electric Co.

INSTALLATION OF SPERRY AIRPORT TYPE PROJECTORS FOR FLOODLIGHTING AT SAN FRANCISCO AIRPORT



GENERAL ELECTRIC AIRPORT TWIN FLOODLIGHT



Courtesy H. C. Ritchie

ILLUMINATION FROM B. B. T. AIR-MAIL TYPE FLOODLIGHT

Courtesy Westinghouse Electric & Mfg. Co.

WESTINGHOUSE BOUNDARY LIGHTS, AND PROJECTORS FOR DISTRIBUTED FLOOD-LIGHTING

in judging his elevation above the field when landing at night, or to enable the pilot of a passing airplane to check his directions by observing roof signs, the exterior surface of each hangar is usually floodlighted by a system of 200-watt or 300-watt Mazda lamps equipped with industrial type reflectors, or by an installation of floodlighting projectors. The light from either installation also provides a fair degree of illumination around the hangar for performances of ground operations.

Wind Indicator Lights.—In order to indicate the direction of prevailing winds, an illuminated wind indicator is employed. The cloth cone ordinarily used is 18 inches in diameter at the throat, 8 inches in diameter at the tail end, and 8 feet in length.

Field Illumination.—One of the most important considerations in lighting equipment for safe night flying operations is that of providing adequate floodlighting over the landing area. It is of prime importance that every assistance be given the pilot who is about to effect a landing. Landing under ideal conditions in daylight requires considerable skill, and when landings are made at night, it is essential to the safety of the pilot and the plane that the illumination afforded gives every possible assistance.

The chief requirements for floodlighting the landing field for safe operations at night may be classified as follows:

> Sufficient light, elimination of glare and blinding of the pilot, uniform distribution of light, and elimination of shadows

There are two accepted systems of floodlighting a field or runway for night landing, which may be classified as follows:

> *Centralized system*, consisting of one or more light sources assembled at one point
> *Distributed system*, consisting of one or more sources spaced several hundred feet apart along the borders or runways

Ceiling Lights.—At a number of the fields on the transcontinental route, a searchlight for determining the height of clouds or "ceiling" above the field, is included. Incandescent searchlights with 12- to 18-inch parabolic reflectors are usually employed for this application.

Count the Trees: A Suggestive Arbor Day Program

PRINCETON, ILL., is a city of beautiful trees—a commonplace statement, perhaps, for there are a multitude of cities with proudly tree-lined boulevards and innumerable homes whose lawns are shaded with choice specimens of forest life. But Princeton is distinguished because it has taken a tree census.

George O. Smith, Superintendent of City Schools, conceived the plan of a tree census as a means of observing Arbor and Bird Day in April, 1927. Under his direction the Junior High School pupils took the census. They counted only shade trees with a circumference of 30 inches or more; 8,500 were found—an average of two to each person in the little city.

Many years—a hundred years—ago, the pioneers who had come from New England in covered wagons planted their streets with elms and maples. Today the magnificent Elm Street, straight beneath the vault of high-arching branches which meet far above the traveler, is only one of the remarkable vistas of the little city. Trees are everywhere in the tract of 1½ square miles, with scarcely any treeless lots.

Some trees measured 23 feet in circumference, but a committee of prominent citizens selected the most beautiful trees among all, and after an interval of several days for observation the citizens of the community voted upon them.

A glorious elm won first, and another third, while a spreading maple of symmetrical contour won second place. Only 24 votes separated the two most highly regarded trees of all the many noteworthy ones. This residential city, which seems a veritable woodland in itself—so tree-studded that aviators unfamiliar with the countryside believe it to be a forest because they see no houses—is annually included on the state-wide city-beautiful tours conducted by the University of Illinois.

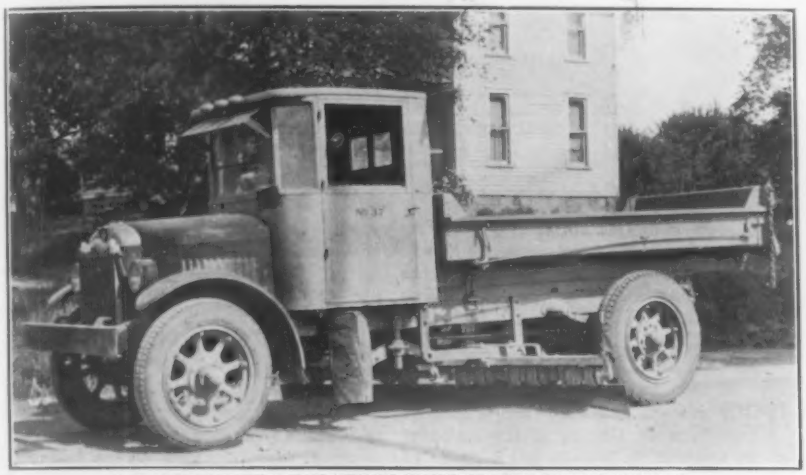
To Mr. Smith and his schools not only Princeton but many another city may well be indebted, for he has not been content with tree-planting alone but has called intensive attention to the monarchs already in existence. Princeton pioneers settled on the prairie, but they forested their rolling grasslands and left a heritage of statelineess to inspire school children and citizens of today. Trees have added meaning for everyone since the Princeton children gained for the city definite information in this novel census.

—MILDRED ANDREWS.

Gravel Road Maintenance in Kent County, Michigan

By O. E. HESS
COUNTY ENGINEER, KENT COUNTY, MICH.

KENT COUNTY has an area 25 miles wide by 36 miles long. In the county we have the city of Grand Rapids with a population of about 200,000 and we have plenty of traffic on our gravel roads. There are 522 miles of improved roads, including 366 miles of gravel, the remainder being hard-surfaced paving, chiefly cement-concrete.



A KENT COUNTY 3-TON TRUCK WITH SPRING BLADE GRADER

We shall always have gravel roads, as it is impossible to get the money to pave them—and it does not pay to do it. Ordinarily, paving is economical only on roads which carry sufficient traffic to warrant the higher type of road. We build gravel surfaces on our low-type roads and, as the traffic increases, some of them eventually reach the point where it becomes uneconomical to continue with the low-type surface. That point is reached when the cost of maintenance per year equals 5 per cent of the cost per mile of the new road. Then it pays to pave. The economics of the situation controls paving in Kent County, because the old gravel roads are maintained at all times in just as good condition as the pavements. In fact, many taxpayers prefer to ride on the gravel roads, because they are smoother than many paved roads. The dust is laid in summer and the snow removed in winter. About the only time that the gravel roads are not so good as the pavements is during a rainy period, when mud splashes on the cars.

Construction

In the construction of gravel roads the work in Kent County differs somewhat from the state work in northern Michigan, because only one type of gravel roads is built, with a 16-foot surface. The gravel surface is all put on loosely to a depth of 7½ inches in one course and is compacted to 6 inches. All the material is under 1 inch in size and must pass through a screen having a 1-inch circular opening. The specifications require that not less than 60 per cent nor more than 85 per cent of the material shall be retained on a screen with ⅛-inch openings. It has been found that material with less than 15 per cent of sand or binder is very hard to compact and does not make any better roads. We use this lower-grade gravel not only for economic reasons, but because it is easier to get a good road with this gravel. The gravel is compacted with a tamper roller, and when the road is accepted from the contractor it is smooth and hard and looks very much the same as a steam-rolled road after it has been maintained for a year or so.

The tamper rollers have been a great help. A few years ago the gravel was put on and then compacted by traffic. It sometimes took three or four years to do this, which was very disagreeable to the traveling public. Now the roads are packed down from the beginning. The roller is cylindrical and the drum is made of sections of cast iron and looks like a cylinder 8 or 10 feet long and 3 feet in diameter, with a surface that looks somewhat like the grid of a catch-basin.

Screened gravel is used for both maintenance and construction and the gravel may contain crushed material. There are a great many different kinds of gravel in the county, and no matter whether sand-gravel or clay-gravel, these specifications give a gravel that is satisfactory. There is no necessity of going into a lot of detail respecting the grading of the material.

Kent County has standardized on types of roads and equipment, and it is certainly to be recommended that any county or organization seriously consider standardization, as it makes possible many economies. Kent County has only two types of roads—gravel and concrete.

MONARCH TRACTOR HAULING TAMPER ROLLER ON A KENT COUNTY ROAD JOB

The gravel roads are all maintained with calcium chloride. If maintenance with tar had been the policy, tar would have been used throughout the work. Tar never has been used in Kent County, but it has been used with more or less success in some other parts of Michigan.

In 1926, 34 per cent of the maintenance cost of our roads went into dragging and scraping, 17 per cent into gravel, 20 per cent into dust layer, 13 per cent into roadbed work, such as filling washouts, etc., 8 per cent for snow removal, and 8 per cent for features that include roadside development, trimming trees, repairing bridges, signs, etc., and 26 per cent into right-of-way.

Use of Spring Scraper

The spring scraper shown in the accompanying illustration is of the reversible type which has been recently developed by Willett and is so constructed that the scraper can be set at any angle from 45 degrees from the center line in one direction to an angle of 45 degrees from the center line in the other direction. This reversible feature eliminates the necessity of driving the truck on the left-hand side of the road. The scraper is raised and lowered by a lifting device which is operated by a hand wheel or sometimes by a ratchet wrench on the end of a shaft or post in the cab. No extra man is required to operate the scraper. The truck driver takes care of this. In fact, it is sufficiently simple to permit the raising and the lowering of the blade when crossing railroad tracks or bridges without stopping the trucks. We have found that the size of truck shown in this picture is about the right one to operate a 10-foot scraper. We are using 3-ton Republic trucks equipped with 10-foot reversible Willett spring scrapers.

The Greatest Public Service One May Perform

INTELLIGENT planning is recognized as essential to the prevention and elimination of waste—and doubly important when that which is saved is human life and strength. Premier McLean, of British Columbia, was asked recently: "What is the greatest service a public man can perform for British Columbia?" As quoted in a recent number of the *Journal of the Town Planning Institute of Canada*, his answer was: "The greatest work a public man can do for this, or any other province, is to help save for the benefit of society the human and material resources that are now being wasted."

The *Journal* says: "Dr. McLean has been a practicing physician for a good part of his life, and knows something of the value of sunlight, clean air and decent planning of dwellings, which have been so largely despised in the construction of our 'great' cities."

Gravel Street Improved at Moderate Cost

TRAFFIC on Church Street, Port Gibson, Miss., includes trucks bearing heavy loads of logs, in addition to a fairly heavy automobile traffic. The gravel surface which had been constructed on Church Street was adequate for the traffic conditions existing when it was put down, but when traffic increased with the growth of Port Gibson, the gravel failed to meet the demands made upon it.

In looking around for a means of improving Church Street, the officials had in mind that the improvement must combine with efficiency a reasonable cost. It was finally decided to apply a surface treatment having an asphaltic content of approximately 60 per cent. The width of Church Street is from 75 to 80 feet, and it is approximately 3,200 feet long. To obtain a proper surface, 20,000 gallons of Texaco liquid asphalt No. 1 were applied to the gravel surface. The result of this application has been a smooth, tough mat, which is dustless and waterproof, and capable of serving the traffic to which it is subjected. Other streets in Port Gibson have been similarly improved at a moderate cost.

CHURCH STREET, PORT GIBSON, MISS., AFTER SURFACE TREATMENT WITH TEXACO ASPHALT

Surface Oiling of Crushed Rock and Gravel Roads in Oregon

THE present extensive oil treatment program in Oregon is the outcome of an attempt in 1923 to use a grade of oil known locally as "fuel oil" as a dust palliative. A section of road was oiled at that time with ½-gallon per square yard. The section thus treated was so sticky and spattered automobiles so badly that the remainder of the road that season was given a somewhat lighter treatment. The section with the heavier application, however, turned out so well the following season that R. H. Baldock, then Division Engineer, now Maintenance Engineer for the Oregon Highway Commission, carried on extensive experiments with the idea of standardizing the treatment so that it could be economically and safely used on the hundreds of miles of crushed rock and gravel surfaces in eastern Oregon, and similar experiments were carried on in another division under the direction of C. W. Wanzer, Division Engineer. The experiments were regarded as successful, and the state, in response to the wishes of enthusiastic motorists, has carried on oiling as rapidly as possible on all roads in condition for treatment.

These treated Oregon highways are typical crushed stone, crushed gravel, or screened gravel roads constructed from one to four years before oiling. Usually the surface as originally constructed had been formed by the spreading of about 2,200 cubic yards of the surface metal per mile to a width of 16 to 20 feet. Normally, the base course, consisting of material passing a 1½-inch circular opening, constituted half the finished thickness, the wearing course, of equal depth, consisting of material passing a ¾-inch circular opening. Usually each course had been subjected during construction to the traffic of trucks, had been well watered, and was well bound at the completion of the project.

The general practice in preparation for oiling now requires that the surface to be treated be bladed, sprinkled, and dragged until smooth and uniform. All holes and other irregularities are repaired; and, immediately prior to oiling, the surface is thoroughly swept with a power broom supplemented occasionally by hand brooming, the sweeping being continued until all patches of loose, fine material are removed and the larger pieces of rock are exposed.

Immediately after sweeping the section is treated with "fuel" oil in two applications, with an interval of two or three days between them to permit the first to penetrate. In general, the first application is at the rate of 3/10- and the second at the rate of 2/10-gallon per square yard. This is the original treatment, to which it is the general practice in Oregon to add in the fall of each year a light application—at the rate of from 500 to 700 gallons per mile—to freshen the previously applied oil and seal the surface for the winter; and other light applications are made from time to time as required. For applying the oil a pressure sprayer has been found to give more uniform distribution, although fair results have been obtained with a gravity sprinkler.

Refuse Collection on Schedule

By CARROLL CARLSON
CHIEF OF SANITARY DEPARTMENT, ORLANDO, FLA.

GARBAGE collection is one of the great problems that face city officials in the cities of the South. It is absolutely necessary that refuse, particularly garbage, be collected often in order to avoid creating a nuisance due to the putrefaction caused by hot weather. On account of infrequent collections and improper care, this was the case in Orlando until it was realized that refuse collection could be placed on an efficient operating basis.

Orlando is known as the greatest inland city in the state of Florida, and located within its limits are 29 fresh-water lakes. Its population has nearly quadrupled since 1920, being 9,200 at that time and 35,300 in 1927. The plan of the city is built up from the location of the various lakes. No alleys were planned, with the exception of a few private ones in the business district. The garbage cans are placed at the rear of the houses, necessitating the collector's carrying the refuse from the rear to the truck. Mixed refuse is collected, consisting of papers, tin cans, garbage, etc.

Refuse collection did not keep pace with the rapid growth of population. At the beginning of 1927 all collection was done by thirteen trucks. The routes were not laid out for the collectors to follow, but were kept in the mind of the foreman in charge. When, finally, these various routes were analyzed and laid out on maps, there were found to be twenty-one routes, and one truck for three or four different routes in widely separated parts of the city. Each truck had a truck driver, and three loaders, who carried the garbage from the rear of the houses in tubs. Once-a-week collection service was maintained, depending upon the discretion and industry of the collector. Complaints averaged from fifty to one hundred daily. No attempt was made to find out the reason for these complaints and no remedy was given. They were merely handed to the truck driver, who disposed of them as he desired. This was the condition of the Department that the writer found at the beginning of the year 1927, when he was given charge.

CITY OF ORLANDO,
Sanitary Division [redacted] **No. 3236**

Complaint Report.

Date .....
Reported by .....
Address ..... Phone No. .....
Rec'd by ..... By .....

Phone	
Letter	
Office	

Nature of Complaint .....

Referred to .....
Investigate & Report ☐
Charges ..... Paid .....
Remarks: .....

Final Report .....

O. K. for File ☐
Signed .....
INSPECTOR

COMPLAINT REPORT, WHICH IS MADE OUT IN DUPLICATE

Original white slip is given to the collector and inspector for proper service and inspection. The pink copy is retained in the office

MAP SHOWING DISTRICTS AND ROUTES FOR GARBAGE COLLECTION IN ORLANDO, FLORIDA

Routes are designated by numbers and sections by letters. Route 5 is entirely in the business district, receiving daily collection service. Colored maps showing the various times of collection are used in the administration offices, greatly aiding in proper supervision

Reorganization Effected

Immediately at the beginning of the year 1927 steps were taken to reorganize the entire Department. Three drivers and nine laborers were immediately dropped from the payroll upon inspection of their work. The city was routed, and definite routes were given each collector. The collector was made to understand that collection twice a week was demanded in residential districts, daily in business districts, and three times per week in semi-business districts. Complaint forms in duplicate were printed and each complaint entered

THE NYE INCINERATOR AT ORLANDO, FLA.

on this form. One copy was given to the emergency truck that was kept for odd-jobs, hauling freight, materials, etc., with instructions to give the people immediate service, and the duplicate was given to the foreman, who was told to inspect the situation and find out the reason why service was not given, and to make arrangements so that the complaint would not occur again. Proper notations were made on the complaint forms as to the nature of the complaint, the remedy given, and the disposal made, and the form was signed by the collector and the inspector. This complaint then was taken up with the driver on the route and he was obliged to explain why such omission was made in his service.

Complaints were reduced to one or two per day after the system was given a chance to operate and get into line. Instead of receiving letters of condemnation for services rendered, the Department received letters of commendation concerning the efficient garbage collection that was being rendered. It bespeaks the efficient operation of any refuse collection department when the citizens themselves do not enter complaints but send in letters of praise.

Better Scheduling

It was decided that even better service could be provided and at less cost. A plan was worked out whereby it was possible to schedule all trucks and thereby reduce the labor payroll by half. The incinerator, the method of disposal used in Orlando, is located approximately four miles from the center of the city. Previously, the loaders were allowed to ride the trucks back and forth from the place of collection to the place of disposal, thereby wasting practically one-half the working time. In order to utilize this waste of energy, the city was divided into two sections, the line of cleavage being the main street running north and south through the city, excluding the business district, the method of handling which will be explained later. These two sections, east and west, were divided into two routes respectively. A collector with three loaders was assigned to each route. One hour was given in which to load the trucks.

At the beginning of the day, Collector No. 1 starts out thirty minutes earlier than Collector No. 2. Collector No. 1 has his truck filled and at the end of an hour takes his load to a previously designated point where the "shuttle" driver takes the loaded truck to the incinerator and leaves the empty one for the collector. While the shuttle driver is hauling the load to the incinerator, Collector No. 2 is collecting on his route, and at the end of his hour period he takes his loaded truck to a designated point, as previously explained, where he is met by the same shuttle driver with the empty truck which he received loaded from Collector No. 1. This arrangement goes on throughout the day. Ten loads per day are gathered by each collector. The same arrangement was made in the other section of the city. The equipment and labor needed to carry out the work in this manner consists of six trucks, twelve loaders, four collectors and two shuttle drivers. Reo trucks equipped with city-built dump bodies are used.

In the business district the arrangement had to be modified to some extent, owing to the fact that it was possible to load the truck more rapidly in collecting from business places and restaurants. Forty minutes is the period given in which to load the truck, and at the end of this time the collector is at the designated location, where the shuttle driver meets him with an empty truck. It was possible to do away with three loaders, retaining two truck drivers. In all, the garbage of the city is collected by eight trucks, eight truck drivers, and fifteen men, whereas previously it had been collected by nine truck drivers and twenty-seven men. An emergency truck is kept at all times in readiness for any complaints that may come in or any overloading of any route that might cause the collector to fall behind in his collection schedule. This truck is used for odd-jobs also, such as collecting trash, hauling freight and other items that come up during the day's work.

The Department uses a fleet of 1¼-ton trucks equipped with wooden hand-dump bodies. Each truck body holds approximately 3½ cubic yards at water-level. Approximately 50 loads of refuse are hauled daily, each load approximating one ton. The cost of collection is approximately $3.29 per ton. This cost is necessarily higher in the South on account of the light-weight refuse—papers, grass cuttings, etc.

Disposal

The refuse is disposed of by incineration, which we consider better than any other for small cities. A 40-ton, 8-hour capacity Nye incinerator was built last year which handles the entire garbage output for the city. No fuel is required to burn the garbage other than what comes mixed with it from the garbage cans. Prison labor is used entirely at this plant, consequently reducing the cost of incineration to a nominal figure. Tin cans form a problem as to disposal, inasmuch as this section of the country is practically level and no fills can be made. Therefore a tin can baler made by Logermann Bros., Milwaukee, was installed, composed of a hydraulic ram operating by an electric motor. Tin cans are pressed into bales of approximately 7 x 14 x 20 inches, weighing approximately 50 pounds each. From one to two tons of cans are baled daily. The bales are then used for filling, building ramps, forming foundations of roads through swamps, etc. We find that this method of caring for the cans works out successfully.

Beginning in January of this year, the truck equipment is gradually being replaced with side-dump Highway trailers, which, it is believed, will materially reduce the cost of garbage collection. We find that the trucks, owing to the starting and stopping, are subjected to a great deal of strain and wear, causing excessive expense for maintenance.

Public Schools Can Train for Citizenship—

1. By making the school a little democracy in whose activities all have an interest and a share.

2. By helping each child to study the needs of people as illustrated by his neighborhood and to understand how those needs are served by government, by corporations, or by individual enterprise.

3. By so arousing the interest of young people in the record of human progress that they continue their reading, observation, and reflection after they leave school.

4. By teaching children the facts about voting, holding office, sincere and intelligent public sentiment, the solution of public problems by persons who have no selfish interest to serve, and other ideals which look toward wise management in community, state, nation, and world.

5. By attention to current economic and social problems and the various solutions that are proposed.

6. By helping young people to understand the spirit of fairness, justice, research, and goodwill which should govern the approach to all controversial problems.

7. By developing an appreciation of and loyalty to the principles that underlie our American democratic government.

—Journal of National Education Association.

KEEP YOUR ROADS OPEN AND SCENES LIKE THIS WILL NOT BE WITNESSED IN YOUR COMMUNITY

The Cost of Snow Blockades

With Expressions of Opinion on the Value of Snow Removal

WHO can estimate the annual cost of snow blockades in the vast northern territory that includes nearly half the area of the United States and practically all of Canada? One authority has set the figure at ten billions of dollars. This includes—in addition to damaged road surfaces and losses on highway investment—the interest charges on millions of idle motor vehicles; winter depression in the oil, automobile-supply and related industries; increased costs and decreased revenue in nearly all lines of business; added fire hazards; delays in mail delivery; ravages in health because of the inability of the doctor to make his rounds; interference with education, commerce and travel; and untold inconvenience to the public in all walks of life.

Engineers agree that one factor alone —prevention of damage to road surfaces—may more than justify the entire cost of snow removal. Striking testimony is given by John N. Mackall, Chairman of the State Roads Commission of Maryland, who says:

"The cost of snow removal over the entire system of 2,500 miles in Maryland never has exceeded $80,000. The cost from 1920 to 1925 averaged $50,000 a year. The removal of snow has entirely eliminated surface repairs in the spring. The cost of these repairs for the three years preceding 1920 was about $200,000 a year. Therefore, we figure that with an average expenditure of $50,000 for snow removal we are actually saving $150,000 in repairs."

Throughout the snow belt, taxpayers and public officials have awakened to the fact that the enormous investment in improved highways must be protected. This involves not only prevention of damage, but also maintaining as nearly constant use of the roads as possible.

In the 36 states wholly or partially affected by snow blockades, according to estimates of the United States Bureau of Public Roads, there are now more than 335,000 miles of public highway surfaced with gravel or higher types of pavement, constructed at an estimated cost of $6,700,000,000 and serving nearly 100,000,000 people. To this should be added the large and rapidly increasing mileage of Canada.

The protection of this enormous public investment is but one of the many sound reasons for maintaining year-round travel. The saving in interest charges alone may more than justify the expense of snow removal, as pointed out by B. C. Tiney, Michigan Highway Engineer:

"The average cost of modern paved highways is $30,000 per mile. Interest on this investment at 4 per cent is $100 a month. If the road is blocked with snow three or four months, we have a fixed charge of several hundred dollars per year giving no value to the public. The average cost of snow removal in Michigan has been from $60 to $80 per mile per year, and only in extreme cases has exceeded $100 per mile."

Engineers point out that thousands of miles of unpaved roads throughout the snow belt are heavily damaged annually at the time of the spring thaws. Drift-in at varying depths, the snow melts unevenly, exposing spots where vehicles form chuckholes. In many cases it is later necessary to regrade and resurface at great expense to save the road from ruin.

To prevent such damage, highway officials recognize the importance of clearing graveled roads early in the spring, even in communities where traffic does not justify maintaining motor travel all winter.

J. R. Allen, Highway Commissioner of Washburn County, Wis., states that with a crawler tractor and a snow-plow 200 miles of road in his county was opened in March, with drifts in many places 6

YES, CALIFORNIA HAS ITS SNOW-REMOVAL PROBLEMS—IN THE MOUNTAINS

TWO SNOW-REMOVAL UNITS OPERATING WITH TRACTOR POWER
At left, Wausau plow, and at right, loader unit throwing snow to side of the road

to 8 feet high, some as hard as ice. Despite the difficulties involved, the roads emerged from the winter season in better condition than ever before, because the snow melted in the ditches instead of in the center of the highway. Officials in not less than twenty-five Wisconsin counties confirm these findings, which are substantiated by the experience of other northern states. All authorities are agreed, however, that a necessary precaution is to keep drains and ditches open, by hand shoveling if necessary, so that the cleared snow, upon melting, may be quickly drained off. Aside from damage prevented by snow removal, it is known that winter cleared roads are available for spring travel two to three weeks earlier than those left to natural thawings.

That the cost of snow removal has been greatly exaggerated in the minds of many persons is the contention of V. R. Burton, Engineer of the Michigan State Highway Department.

Fewer accurate cost data are available from cities than from county and state officials, owing to the fact that snow removal usually is included with other street maintenance work. Records compiled by City Engineer S. S. Bunker, Bangor, Maine, indicate that snow has been removed in that city with a Caterpillar tractor at a cost of $9.52 per mile, not including insurance, depreciation or garage rental. The average cost on six main highways radiating from Bangor was $20.93, according to the Chamber of Commerce of that city.

How the use of motorized equipment lowers costs of snow removal is strikingly illustrated by a statement from John A. Krause, Clerk of the township of Milwaukee:

"The Caterpillar tractor and plow have saved our township enough so that we could reduce our taxes one-half mill; or, if this is not done, the money is available for other purposes. If we had owned this equipment at the beginning of the season, the total cost of snow removal would not have exceeded $500. But if we had had to do all the work by hand, the cost would have amounted to at least $10,000, and our roads would have been closed to automobile traffic most of the time."

The up-to-date community once enjoying winter freedom of the open road, never again is content to return to the old order of paralyzed traffic.

A CATERPILLAR THIRTY WITH WAUSAU, JR., SNOW PLOW WORKING AT CENTIGO, WIS.

The Girard, Ohio, Water-Softening Plant

GIRARD is situated in Trumbull County north of the city of Youngstown, Ohio. The water-works was pur- four in number, 7 feet square in plan and 14 feet deep. The retention period is 20 minutes. The tanks are provided with products of combustion. A scrubber and a drier are provided and a motor-driven

Influencing Public Opinion

By HARRY A. OVERSTREET
HEAD OF DEPARTMENT OF PHILOSOPHY, THE COLLEGE OF THE CITY OF NEW YORK.

MOST of us who are in public service work become fairly doleful about the possibility of changing public opinion. However, notable changes in public opinion have occurred in the past, and there is no reason why they should not occur in the future. There was, for example, the change from king-worshipping to democracy, also a change from a belief in the inferiority of women to a conviction that women should be the political equals of men. At the present time, public opinion seems to be slowly undergoing a change from the traditional belief in the absoluteness of national sovereignty to a belief in the need for national *inter*dependence. In the region of commerce, to take an apparently trifling instance, public opinion has undergone a change in very recent years from a complete acceptance of a variable-price system of retail buying and selling to a one-price system.

I refer particularly to the last change because it gives a clue to the important question of how public opinion can be changed. Mr. Wanamaker changed public opinion, and did so with a fair degree of rapidity. How did he do it? In two ways—by setting the stage, and by appealing to certain fundamental impulses in his public.

He did not scold them. He did not preach to them. He did not send them learned pamphlets, explaining that the one-price system was the only system compatible with human intelligence and honesty. In short, he did not waste his time appealing to their "reasoning power." He let the reasoning power take care of itself— which it proceeded to do.

What he did was, first, to arouse expectation. He was a good dramatist. He announced a great opening, and invited the public. And when the public came, the good dramatist turned into the excellent host. He welcomed his public courteously, let them wander through his building without being urged to buy, [illegible] room. He struck into their [illegible] changing public opinion. *One must find the basic wishes of the public and apply oneself to the satisfaction of those wishes.* The so-called "reformer" usually does otherwise. He addresses himself to the intellect of his public, tries to reason with them, sometimes scolds them, and always "admonishes" them—all of which subtly infuriates, because the public, admonished and lectured to, is made to feel inferior.

Human beings are essentially systems of wants. They are not, first and foremost, rational beings. Some of these wants are trivial. Some are foolish and self-destructive. But some are basic and constructive. The person interested in the advance of public welfare will seek to find out what the fine basic wishes of his public are and will address himself to them.

Thus the chief need of the person engaged in the attempt to influence any public—and there are, of course, many kinds of publics—is to become psychologically minded. He must see his public not as mere voters, nor as mere householders, nor even as mere dumb-bells, but as human beings with warm desires and with equally warm fears and hatreds. If he can visualise these basic emotions and address himself to them, he will have by far the greatest chance both of capturing their attention and of winning their effective assent.

I do not mean that there should never be an appeal to the reasoning power of the public. But back of that appeal and deeper than it, there must always be the appeal to what people basically want. Sometimes they are not themselves aware of what they basically want. The astute psychological analyst of his public will know how to raise a dormant want into consciousness. At any rate, dormant or otherwise, it is the basic want which he will learn to discover and to satisfy.

The intellectualistic approach to the public is always the easiest, because it requires no careful study of the psychological make-up of the public. It simply requires some favorite ideas (favorite to the promulgator) and paper on which to print them. The intellectualistic way is the easiest way—but also the most futile. The one who succeeds is the one who puts himself at the emotional point of view of his public.

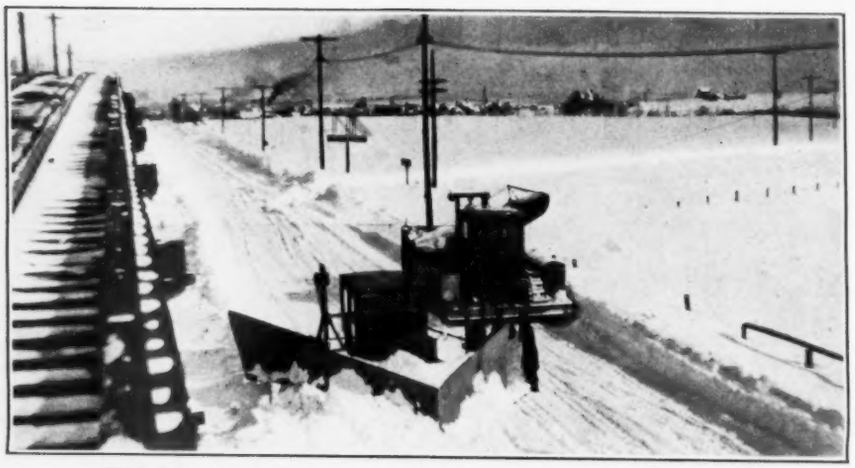
ACKNOWLEDGMENT.—Abstracted by the author for THE AMERICAN CITY from his address before the recent Annual Convention of the National Municipal League.

Zoning and City Planning Are Not Strait-jackets

By WILLIAM D. HUDSON
CITY PLAN ENGINEER

ZONING, like any other law, must be supported by the great majority of the community in order to operate successfully. To be respected, it must be justly applied and enforced without favor. In its workings, zoning frequently reduces to a struggle, or at least an acrimonious debate, between the individual and the mass, in which, as is [illegible] defeat. Individual and group resistance [illegible] zoning or city planning in its entirety [illegible] lective privilege of choosing its course of development.

The fact that a city has adopted or contemplates adopting the disciplinary measures of a city plan is evidence of that city's vitality; and it is a fact that the need for a plan usually arises from a more than ordinary tendency toward some special trend of growth. Without [illegible] that have adopted



TWO SNOW-REMOVAL UNITS OPERATING WITH TRACTOR POWER
At left, Wausau plow, and at right, loader unit throwing snow to side of the road

to 8 feet high, some as hard as ice. Despite the difficulties involved, the roads emerged from the winter season in better condition than ever before, because the snow melted in the ditches instead of in the center of the highway. Officials in not less than twenty-five Wisconsin counties confirm these findings, which are substantiated by the experience of other northern states. All authorities are agreed, however, that a necessary precaution is to keep drains and ditches open, by hand shoveling if necessary, so that the cleared snow, upon melting, may be quickly drained off. Aside from damage prevented by snow removal, it is known that winter cleared roads are available for spring travel two to three weeks earlier than those left to natural thawings.

That the cost of snow removal has been greatly exaggerated in the minds of many persons is the contention of V. R. Burton, Engineer of the Michigan State Highway Department.

Fewer accurate cost data are available from cities than from county and state officials, owing to the fact that snow removal usually is included with other street maintenance work. Records compiled by City Engineer S. S. Bunker, Bangor, Maine, indicate that snow has been removed in that city with a Caterpillar tractor at a cost of $9.52 per mile, not including insurance, depreciation or garage rental. The average cost on six main highways radiating from Bangor was $20.93, according to the Chamber of Commerce of that city.

How the use of motorized equipment lowers costs of snow removal is strikingly illustrated by a statement from John A. Krause, Clerk of the township of Milwaukee:

"The Caterpillar tractor and plow have saved our township enough so that we could reduce our taxes one-half mill; or, if this is not done, the money is available for other purposes. If we had owned this equipment at the beginning of the season, the total cost of snow removal would not have exceeded $500. But if we had had to do all the work by hand, the cost would have amounted to at least $10,000, and our roads would have been closed to automobile traffic most of the time."

The up-to-date community once enjoying winter freedom of the open road, never again is content to return to the old order of paralyzed traffic.

A CATERPILLAR THIRTY WITH WAUSAU, JR., SNOW-PLOW WORKING AT CENTIGO, WIS.

The Girard, Ohio, Water-Softening Plant

GIRARD is situated in Trumbull County north of the city of Youngstown, Ohio. The water-works was purchased by the city in 1922, and 1925 a modern water-softening plant was constructed. The supply is obtained from an abandoned coal mine at a depth of 160 feet. The water is hard and has a high iron content. The consumption is about 400,000 gallons per day.

The softening plant consists of mechanical mixing chambers, settling basins, recarbonation chambers, two filters of ½-million gallons daily capacity each, a clear well of 93,000 gallons capacity, and two elevated storage tanks of 512,000 gallons total capacity. The chemical equipment consists of dry feed machines for the application of lime and a carbon dioxide generating plant. The mixing chambers are four in number, 7 feet square in plan and 14 feet deep. The retention period is 30 minutes. The tanks are provided with horizontal paddles which are rotated at the rate of 3 r.p.m. The settling basins have a retention of 3½ hours and the outlet of each is over a skimming well into the recarbonation chambers. These are 9 feet 3 inches by 10 feet 9 inches in plan and 12 feet 6 inches deep above the distribution grids. The grids in each chamber are perforated with 64 ⅛-inch opening spaced 14 inches center to center one way and 16 inches the other way.

The carbon dioxide gas plant consists of a crusher for coal, a magnetic separator to remove foreign particles of iron, a feeder to the pulverizer, and a combined pulverizer and blower that delivers coal to the furnace where it is burned to complete products of combustion. A scrubber and a drier are provided and a motor-driven centrifugal water piston pump discharges into a receiver which is connected to the distributing grid. This plant will produce 21 pounds of CO_2 per hour.

Floats are provided in the clear well which actuate automatic starts and stops on the lower-service pumps. High-service pumps are also automatically controlled by automatic devices actuated by a pressure regulator.

The quality of the supply is such that no disinfection is required. Bacterial analyses are made daily by a chemist in charge. Chemical analyses indicate that the application of 10 grains per gallon of lime as CaO, removes all the carbonates, and an excess of about 2 p.p.m. of CO_2 is present in the filtered water.

Influencing Public Opinion

By HARRY A. OVERSTREET
HEAD OF DEPARTMENT OF PHILOSOPHY, THE COLLEGE OF THE CITY OF NEW YORK.

MOST of us who are in public service work become fairly doleful about the possibility of changing public opinion. However, notable changes in public opinion have occurred in the past, and there is no reason why they should not occur in the future. There was, for example, the change from king-worshipping to democracy, also a change from a belief in the inferiority of women to a conviction that women should be the political equals of men. At the present time, public opinion seems to be slowly undergoing a change from the traditional belief in the absoluteness of national sovereignty to a belief in the need for national *inter*dependence. In the region of commerce, to take an apparently trifling instance, public opinion has undergone a change in very recent years from a complete acceptance of a variable-price system of retail buying and selling to a one-price system.

I refer particularly to the last change because it gives a clue to the important question of how public opinion can be changed. Mr. Wanamaker changed public opinion, and did so with a fair degree of rapidity. How did he do it? In two ways—by setting the stage, and by appealing to certain fundamental impulses in his public.

He did not scold them. He did not preach to them. He did not send them learned pamphlets, explaining that the one-price system was the only system compatible with human intelligence and honesty. In short, he did not waste his time appealing to their "reasoning power." He let the reasoning power take care of itself— which it proceeded to do.

What he did was, first, to arouse expectation. He was a good dramatist. He announced a great opening, and invited the public. And when the public came, the good dramatist turned into the excellent host. He welcomed his public courteously, let them wander through his building without being urged to buy. He did more. He turned into their friend. He announced to them quite frankly that certain goods were not perfect and that they could be had at cheaper prices in the basement.

He gained the day for the one-price system. Why? Because he appealed to certain basic wishes in his public. His public found it a pleasure to be unmolested, a pleasure not to be hoodwinked into buying damaged goods as if they were perfect, a pleasure to be free of the necessity of quarreling over prices.

I think that tells the essence of the story about the technique to be used for changing public opinion. *One must find the basic wishes of the public and apply oneself to the satisfaction of those wishes.* The so-called "reformer" usually does otherwise. He addresses himself to the intellect of his public, tries to reason with them, sometimes scolds them, and always "admonishes" them—all of which subtly infuriates, because the public, admonished and lectured to, is made to feel inferior.

Human beings are essentially systems of wants. They are not, first and foremost, rational beings. Some of these wants are trivial. Some are foolish and self-destructive. But some are basic and constructive. The person interested in the advance of public welfare will seek to find out what the fine basic wishes of his public are and will address himself to them.

Thus the chief need of the person engaged in the attempt to influence any public—and there are, of course, many kinds of publics—is to become psychologically minded. He must see his public not as mere voters, nor as mere householders, nor even as mere dumb-bells, but as human beings with warm desires and with equally warm fears and hatreds. If he can visualize these basic emotions and address himself to them, he will have by far the greatest chance both of capturing their attention and of winning their effective assent.

I do not mean that there should never be an appeal to the reasoning power of the public. But back of that appeal and deeper than it, there must always be the appeal to what people basically want. Sometimes they are not themselves aware of what they basically want. The astute psychological analyst of his public will know how to raise a dormant want into consciousness. At any rate, dormant or otherwise, it is the basic want which he will learn to discover and to satisfy.

The intellectualistic approach to the public is always the easiest, because it requires no careful study of the psychological make-up of the public. It simply requires some favorite ideas (favorite to the promulgator) and paper on which to print them. The intellectualistic way is the easiest way—but also the most futile. The one who succeeds is the one who puts himself at the emotional point of view of his public.

ACKNOWLEDGMENT.—Abstracted by the author for THE AMERICAN CITY from his address before the recent Annual Convention of the National Municipal League.

Zoning and City Planning Are Not Strait-jackets

By WILLIAM D. HUDSON
CITY PLAN ENGINEER

ZONING, like any other law, must be supported by the great majority of the community in order to operate successfully. To be respected, it must be justly applied and enforced without favor. In its workings, zoning frequently reduces to a struggle, or at least an acrimonious debate, between the individual and the mass, in which, as is right and proper, the individual meets defeat. Individual and group resistance to the principles of city planning, and the laws of zoning particularly, occurs frequently at their inception, but, after a few years, if the work has been reasonably well performed, criticism gives place to requests for information and interpretation of the law as applied to specific problems.

To the individual, zoning as to use, height and area may be restrictive, whereas to the majority of citizens it is a purely protective measure. And just as the individual has the right to shape his destiny, so has a community the collective privilege of choosing its course of development.

The fact that a city has adopted or contemplates adopting the disciplinary measures of a city plan is evidence of that city's vitality; and it is a fact that the need for a plan usually arises from a more than ordinary tendency toward some special trend of growth. Without exception, those cities that have adopted zoning or city planning in its entirety are going concerns. They possess characteristics which distinguish them in a prominent way and, like successful men, they attract public interest.

Encouraging Good Influences and Repressing Bad Ones in City Development

It should be emphasized that the real purpose of city planning is not to standardize, but to encourage the best in civic character; to preserve individuality and subordinate the faults; to provide generously of light, air and circulation, and

prevent self-strangulation. In short, the city plan directs the community along the shortest path toward a definite goal recognized as its rightful objective.

Owing to the widely diverse conditions found in communities, no two plans can be alike. The principal variables to be considered are: the pursuits of the people, their purchasing power, per capita wealth, topography, proximity to other cities, area, density of population and rate of growth, layout of streets, accessibility and transportation, utilities, location, climate, degree of general education, predominant nationality, form of government, bonded debt, tax rate, real estate market and values, and that indefinable attribute we term personality. In a given city, some of these factors are very definitely fixed. By careful planning their influence upon the civic structure can be emphasized or repressed as may be required, so as to produce finally an harmonious ensemble. But if they are not all accounted for and considered, the plan is likely to prove discordant.

Zoning, more than any other element of the city plan, is effective in drawing together the sprawling fragments of a disorganized but vigorously growing city, and converting it into an efficient, well-balanced organization. But to be successful, its laws must be sanely conceived and wisely administered. The safeguards are—utmost publicity from the start, rigid observance of legal requirements, and a carefully selected board of appeals. Those responsible for the administration of zoning ordinances must be of the highest standing in the community. Instances are too numerous in this country where zoning ordinances have been surreptitiously repealed or amended, with profit to the individual and harm to the community. Changes in economic conditions may develop latent tendencies in a city, not apparent at the time of the adoption of the city plan. The legislative machinery should provide for amendments needed for this or other legitimate reasons. The zoning ordinance is not a strait-jacket, but rather a corrective appliance with adjustable parts. And while it cannot create forthwith commercial and industrial prosperity, it can mold civic talents to better purpose.

Collaboration of Artists Promises New Beauty in Cities

By JOHN GREGORY
SCULPTOR

THE use of polychromy in the Philadelphia Museum of Art again unites with architecture, both painting and sculpture, which since the Renaissance had become independent. Finished, with the exception of the pedimental sculptures, this building stands as a link between the past and the future. Knowledge and experiment have been combined in its creation, first in the use of a golden "Kato" stone in the walls, and later in the use of polychrome terracotta in the decoration and in the roof-tiles. Trumbauer, Zantzinger, and Borie are the associate architects. The associated artists were gathered together gradually, and much time has been passed in preparation and study, elaborate scale models were made and every detail was tried out in the form and color at small scale. Later, full-size models in colored plaster were hoisted into position on the framework of the building and the effect judged. Collaboration in its fullest sense was engaged in between the allied artists (E. Paul Jennewein and the writer being the sculptors, and Leon Victor Solon, the polychromist) under direction of the architects, and the work became an education as well as a collaboration to those concerned in it.

A combination of research and invention makes this new synthetic creation a bridge between the classic and the modern, a development of what has been done and, at the same time, a forerunner of what will be done. Its scholarly roots are in Greece, but its flowering crest is in the clouds. It is a forerunner of great municipal effort and expressions of civic pride that will dwarf and surpass in magnificence the creations of other triumphant ages.

What grandeurs public buildings will rise to in the future fires the imagination. Vast wealth and national enterprise will make of these edifices monuments of art and engineering skill. Upon framework of ingenious planning will be built architectural designs of studied beauty enriched with sculpture and decoration in all the materials that science will develop. Chemistry will glaze them with colors on a scale and of an intensity unthought of as yet. An important part of the nation's activity will go into the creation of this encompassing beauty; with the perfection of machinery the people will be released for the enjoyment of the pleasures of art, and beauty will be the natural interest of their leisure. The nations will be engrossed in art, and municipalities will vie with each other in the creation of beautiful cities and gardens. A great vision is promised, a vision of coordinated artistic effort on gigantic proportions, a Titanic collaboration extending from coast to coast.

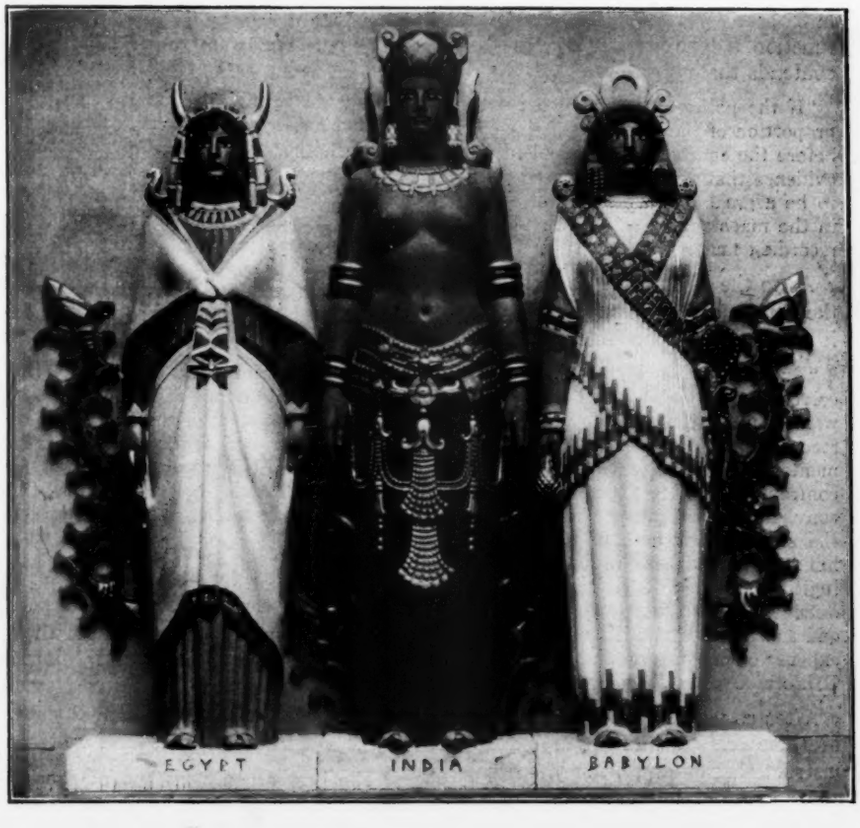
FACADE OF THE NEW PHILADELPHIA MUSEUM OF ART, WHICH, ACCORDING TO MANY ARCHITECTS AND ARTISTS, HERALDS A NEW DAY OF BEAUTY IN PUBLIC BUILDINGS

John Gregory, sculptor, and Leon V. Solon, polychromist, collaborating under the general direction of the architects, Trumbauer, Zantzinger, and Borie, have produced these highly colored figures, designed as pediment decorations for the side pavilion on the readers' left, in the illustration of the Philadelphia Art Museum, on the opposite page.

The gold and brilliant coloring of the figures repeats and intensifies the tones of the roof tiles, which are of polychrome terra-cotta.

The barbaric splendor of the figures which Messrs. Gregory and Solon have evolved, and which are shown in the two illustrations herewith, is matched by those in the right pavilion pediment of the building, on which E. Paul Jennewein has collaborated with Mr. Solon.

As the work progressed experimentally upon this daring adventure in modern collaboration, and as decorative effects in color and form were tried and rejected, the architects' original idea of friezes along the sides of the Museum's end pavilions was abandoned.



Urgent Need for Greater Efficiency in Criminal Identification

THAT an efficient police system is the best defence of organized society against crime, and that the present undeveloped status of criminal identification constitutes a serious obstacle to police efficiency, are facts given special emphasis in a report of the Committee on Criminal Statistics and Identification of Criminals, made public on December 5, 1927, by the National Crime Commission. The committee, of which Frank O. Lowden, former Governor of Illinois, is Chairman and Dr. Louis N. Robinson, Secretary, urges more effective cooperation by local police departments with the Division of Identification and Information of the Bureau of Investigation of the United States Department of Justice, and the establishment of central bureaus of identification in every state.

So far only thirteen states have such bureaus, and many of these have been so recently appointed as to have scarcely begun to function. The report contends that:

"If the police are to bring a reasonable proportion of the criminals of this country before the courts of justice and to present evidence that will convict, there will have to be a great development and expansion in the machinery now used in taking and recording finger prints."

As to the importance of such bureaus, the report cites the record of the California Bureau, where it says:

"Out of the first 48,000 finger prints received by the California Bureau, 7,500 were identified as having prior criminal records, unknown to the arresting departments. Many habitual delinquents, when confronted with the records of their prior conviction, plead guilty and thereby save the state the expense of jury trial. Six hundred and sixteen of the arrests were fugitives escaped from penal institutions outside of this state. The identification and subsequent extradition eliminated the expense of prosecution and confinement in California. . . ."

After emphasizing the additional need of these state identification bureaus to instruct sheriffs and other peace officers on the proper method of securing and recording finger prints, the report gives the following arguments to support its case:

"A state bureau of criminal identification is an invaluable aid to all agencies and organizations that deal with offenders. Of what significance is a severer penalty for a repeater, or a life sentence threatening a man who is convicted of his fourth felony, if there is no authoritative means of ascertaining how many previous sentences he has served? Certainly the offender will not confess his past dealings with the law, and unless he happens to be particularly notorious or has the ill luck to be tried in the same court or remembered by a judge or prosecuting attorney, how can the recidivist be singled out for either added punishment or special corrective treatment? Every social agency today insists on securing as complete a case history as it is possible to obtain, before attempting to deal with an individual. The success of our newer methods of handling offenders is going to depend in large part on what we can find out about them.

"In our opinion state bureaus of criminal identification are indispensable units in a national system of criminal identification. It is impossible for the Federal Bureau to do all the work; it can, however, serve as a clearing-house for all the 48 states. This is as much as it can or should do."

A B

FINGER PRINTS

A, impression made by fully rolling the finger; B, impression from same finger partly rolled

In reply to an inquiry from THE AMERICAN CITY as to how local police departments can best cooperate with the Division of Identification and Information in Washington, J. Edgar Hoover, Director of the Bureau of Investigation of the Department of Justice, writes:

"The best or only method of cooperation with the Division in Washington is for every law-enforcement official to record the finger prints of every malefactor who comes under his jurisdiction, and forward a copy of said finger prints to the Bureau. The Bureau is receiving at the present time between seven and eight hundred a day. However, there is room for considerable improvement and decided extension of the work of the Division. This will be commensurate with the further understanding on the part of all law-enforcement officials that the transmission of criminal identification data to the Bureau is not only a privilege, but a duty to themselves and to their fellow officers. The National Division of Identification and Information is a cooperative organization, solely. The only information that may be supplied to inquirers consists of data which have been previously forwarded to the Bureau by other officials. You will readily see, therefore, that the more complete and extensive the Bureau records, the more effective will be the service which it may render."

The extent to which the work at the Washington headquarters has already grown is indicated in the following excerpts from Director Hoover's address before the 1927 convention of the International Association of Chiefs of Police:

"From June 30, 1926, to June 1, 1927, there were received 151,273 finger prints. The Division searched, during the same period, 166,658 prints. The very satisfactory figure of 46,771 identifications were made during this period.

"Under date of June 1, 1927, there were in the possession of the Division of Identification and Information of this Bureau, a total of 1,203,864 prints. These are prints of actual current value. The progress made during the past year has, I believe, been highly gratifying. However, there is room for improvement. In this connection I am very strongly of the opinion that the Division of Identification and Information is not receiving all of the finger-print records which should be forwarded to it by the law-enforcement officers interested in its successful operation. Many chiefs of police and law-enforcement officers are only transmitting prints of criminals whose record is unknown to them in whole or in part. Where a criminal is apprehended whose record for some reason they believe is fully known to them, in many instances no finger-print record or inquiry is forwarded to the Division.

"I strongly urge the desirability, from the standpoint of efficiency, of each and every one of its correspondents' forwarding to the Division of Identification and Information the finger-print records and inquiries of practically all the criminals who may be placed in custody, except those of a purely local and minor character, and those who commit more or less insignificant and unimportant offenses."

To meet the desire of many police officials for more definite knowledge of the best methods of taking and recording finger prints, THE AMERICAN CITY is glad to publish the illustrated outline by the Department of Justice which follows:

How to Take Finger Prints

Prepared by Identification Division, Bureau of Investigation, United States Department of Justice

IT IS essential in taking finger prints to understand how to get the best results and apply that knowledge to every set of prints taken. It is of the utmost importance that the operator who is beginning to take finger prints should be thorough, for that quality once developed will become a habit.

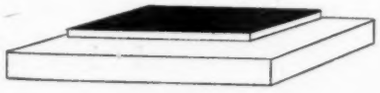
Finger prints can be taken with a small portable outfit. The equipment for taking prints in large bureaus is surprisingly simple and cheap. It consists of printer's ink, an inking slab on which the ink is first distributed, a roller, an inking plate on which the fingers are inked, a small table, a card holder, finger-print cards, rags, gasoline or benzine for cleaning the fingers before and after they have been printed, and for cleaning the outfit after it has been used.

The ink generally used in finger-print work is known as job black, that being the usual color in which finger impressions are taken. One advantage of printer's ink is that it dries rapidly, permitting the handling of prints without smudging soon after they are taken. In winter, if the ink becomes too thick to produce the best results, it can be thinned by warming. If this does not sufficiently thin it, a reducing fluid, which can be procured at any printers' supply house, may be added.

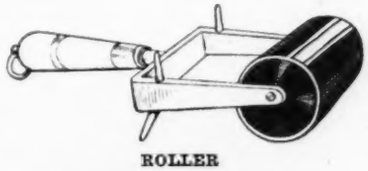
The inking slab, on which a very small amount of ink is placed and rolled to form a thin film, may be of any material; marble, glass, aluminum, zinc, tin, copper, or brass are generally used. This is a matter of individual preference. Any of the materials mentioned, or others, may be used with satisfactory results. In the illustration, the inking slab is a piece of marble 10 inches square, set in wood.

The best roller used in finger-print work is similar to that used by printers in taking galley proofs. The size of the roller depends upon the size of the equipment and the preference of the operator. The one in the illustration is 6 inches long and 2 inches in diameter.

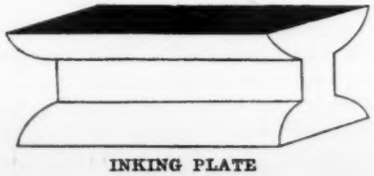
When the ink has been thoroughly distributed on the inking slab, it is transferred to the inking stand or plate on which the fingers are inked. For general work in any bureau, a very good inking plate, as shown in the illustration, can be made shaped like a T section of railroad rail, with the top wider and flat. The body is made of wood and the covering for the top may be made of zinc, tin, copper, brass, or aluminum. It has a pronounced advantage over a square block, as the surface, by sloping away from the top, permits the fingers that are not being inked to fit underneath.



INKING SLAB



ROLLER



INKING PLATE

This is of particular advantage when the fingers are stiff or crippled. Impressions can be taken on any table, but the best results are obtained where the subject does not have to stoop. The table should be of sufficient height to allow the subject's forearm to be in a nearly horizontal position.

Finger prints are taken on cards 8 by 8 inches, as this size card and the drawer system of filing are now in general use. The illustration shows a standard finger-print card with the finger print properly taken.

Before the operator begins to take prints, he should take the necessary precautions to see that the subject's fingers, as well as the appliances, are thoroughly cleaned, for the least dirt may impair the prints and make needless trouble for those who must handle the prints later. The operator places a small amount of ink on the inking slab and thoroughly distributes it by moving the roller back and forth in every direction. When a thin, even film covers the slab, the ink on the roller is transferred and evenly spread on the plate so that it just covers it. The operator then places a card on the holder and is ready to begin taking finger prints.

The person whose finger prints are to be taken should stand in front of and at forearm length from the table. In taking prints of the right hand the operator should be on the left and to the front of the subject. When in this position the right thumb of the subject is grasped with the right thumb and index finger of the operator, at the same time closing his other fingers over the hand of the subject, and with the left thumb and index finger the operator holds the thumb of the subject at the nail, as shown in the illustration. The thumb is then placed on the inking plate, the bulb facing to the right, the plane of the nail being at right angle to the inking plate. With a light, even pressure, the operator rolls the thumb away from him until the bulb of the thumb, which originally faced to the right, now faces to the left, the plane of the nail again being at right angle to the inking plate. The impres-

Local Officials Urged to Cooperate with Department of Justice

As the finger-print system is recognized as a positive means of personal identification, and as the taking of good, clear impressions is essential in the science and practice of finger prints, it is imperative that a simple and standardized method of taking finger prints be adopted. With this aim in mind, this statement has been prepared and published as a suggestion and guide to the many peace officials who are now or may become contributors to the Identification Division. The cooperation of all peace officials will be of material assistance to this division in the handling of the hundreds of finger-print records received daily and will result in better and more satisfactory service to our many contributors.

STARTING TO INK LEFT THUMB

TAKING ROLLED IMPRESSION OF SINGLE FINGER

TAKING PLAIN IMPRESSION OF FOUR FINGERS

sion of the thumb is then printed in the space marked "1.—Right thumb," on the card, in the same manner as described for the inking. The print should include all the bulb of the thumb and show the crease at the joint. The index, middle, ring, and little fingers of the right hand are then taken in the same manner as described for the thumb.

To take the rolled impressions of the left hand, the subject should be moved the width of the body to the right of the operator. This will bring the left hand to approximately the same position that the right was in. The fingers and the thumb of the left hand are inked and printed in the same manner as described for the right hand, except that they are rolled toward the operator instead of away from him.

The illustration on page 116 shows one of the reasons for taking rolled impressions: A and B are impressions taken from the same finger. A being fully rolled, the whole contour of the pattern is shown; B being partly rolled, only part of the impression is shown. It is therefore necessary to take rolled impressions of all fingers and thumbs to determine the type of pattern. It is also plain to see that the larger surface enables the finger-print expert to select a greater number of points of comparison.

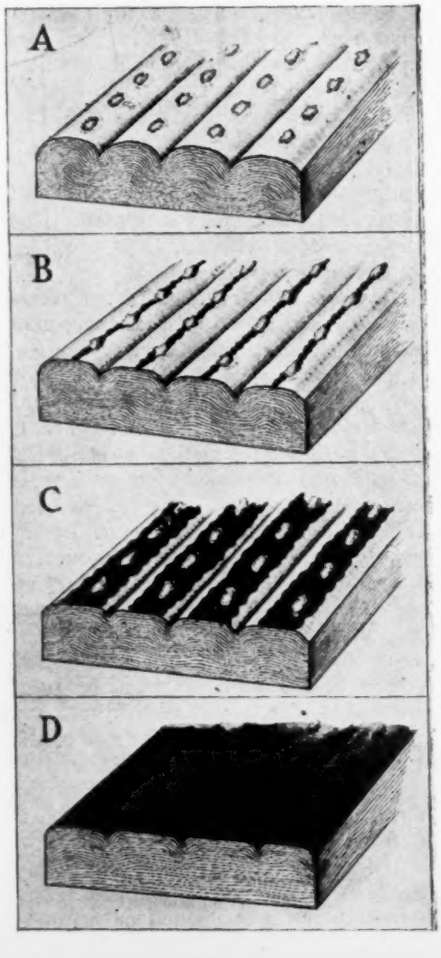
After the rolled impressions are completed, the plain impressions of the fingers and thumb of both hands are taken. The operator with his right hand grasps the right hand of the subject at the wrist, and with his left hand presses all of the subject's fingers simultaneously on the inking plate. The thumb is then inked without rolling. The fingers of the right hand are then impressed in the space provided for it at the bottom of the card, in the same manner described for inking it. The plain impression of the thumb is then taken in the space provided for it. The plain impressions of the fingers and thumb of the left hand are taken in the same manner as described for the right. The fingers of each hand must be taken simultaneously to be of any benefit as the rectifier of mistakes that may have been made in taking the rolled impressions. Plain impressions should never be taken a finger at a time. Plain impressions are valuable as a check on the operator, as a glance at them will show if any of the rolled prints are placed in the wrong spaces on the card. Unfortunately, carelessness is a habit with many operators. Sometimes the very part of the rolled impression that should be clear is smudged, and in such cases the print of the same finger will usually be clear in the plain impressions.

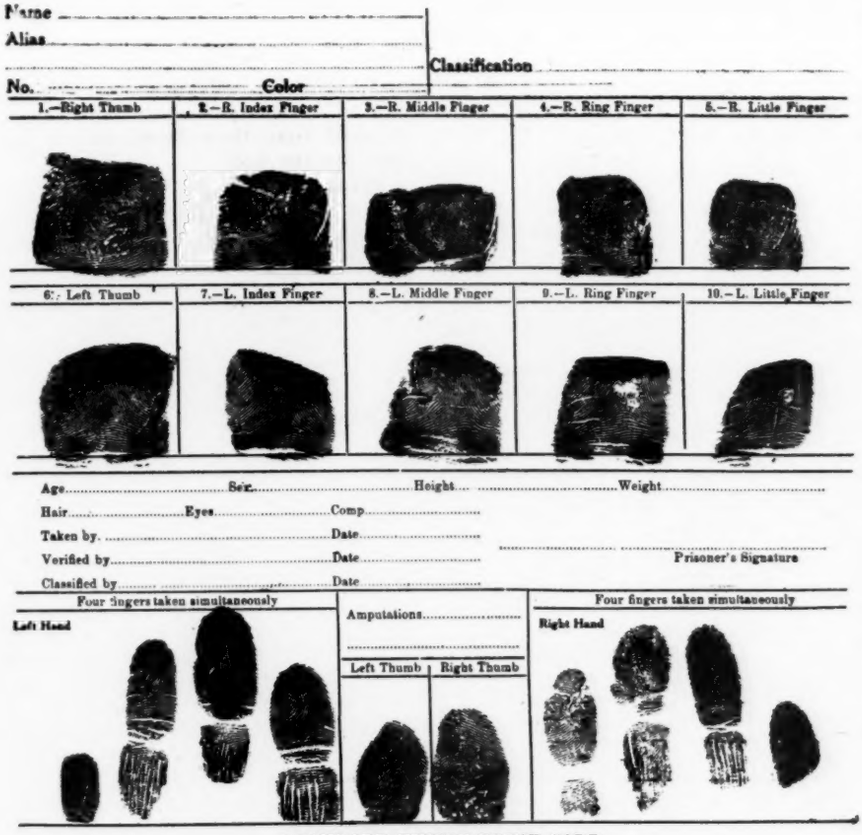
The amount of pressure exerted while inking and printing is very important. Experience will teach the operator to adjust the pressure to get the best results if he is willing to learn from experience. The illustration shows how important it is to gage the amount of pressure; that will come only from practice coupled with observation. Illustration A shows the finger ridges before the ink or pressure is applied. In B the pressure was too light. The print may show breaks where there were none on the finger tips. In C the amount of pressure was correct, and the black of the ridges and the white of the furrows show to the best advantage. In illustration D, too much pressure has been exerted. It will be noticed that the ridges have been flattened out, making the black lines show too broad, and in places they obliterate the white lines of the print where it is essential that they show. The best prints are those in which the black and white lines are equally divided.

Where there is an amputated finger, the operator should mark the space for the missing finger with the letters "AMP." This is imperative, for otherwise the classifier, relying on those who take finger prints, could not be positive as to its proper classification, because of the uncertainty whether or not the subject has an amputated finger.

Here, the operator may reason, the plain impressions with a finger missing would reveal this. The space for a finger may be blank, and yet that finger may not be amputated. For instance, there may be a fresh cut or a felon on that finger, making it impossible for an impression to be taken. For this reason, on every finger-print card there should be a blank space for "Remarks incident to damaged or amputated fingers." *The operator should always fill out this blank space with a statement of the damaged condition or that a finger or fingers are amputated.* Where, on account of fresh cuts, felons, or damaged fingers, it is possible to delay the taking of finger prints for a few days, good impressions can be taken as soon as the fingers have had sufficient time to heal and the ridges to be restored to their normal condition.

An experienced operator will take a set of prints in less than one minute. The beginner, however, should not try to do quick work. He should direct all his attention to doing good work. If he is careful at the beginning, every set of prints he takes will be a credit to him.





STANDARD FINGER-PRINT CARD

After a time it will be harder for him to take poor prints than good ones, while, if his aim is swiftness, it may be procured at the price of wasting the time of those who are to handle the prints later.

"Certain Practices in City School Administration"

What Is the Best and on Whose Authority?

WHAT constitutes the best practice in any particular field of city school administration? And to what source shall the educational official turn for authoritative information and sound precedent when some problem arises or some change of policy is being considered within his own administrative organization?

Under the title quoted above, Walter S. Deffenbaugh, Chief of City Schools Division, United States Department of the Interior, Bureau of Education, has prepared an 18-page leaflet, which is in effect a remarkably compact reference work on the whole subject. In addition to giving much valuable material on actual practices in schools, it summarizes *best* practices as interpreted from textbooks on school administration, current educational magazines, and city school surveys. Such summaries are shown under most of the general divisions into which the material falls, namely: the board of education; superintendent of schools; deputy, associate, and assistant superintendents; business manager; superintendent of school buildings; elementary school principal; supervisors; and the certification of teachers. A statement of practice and certain statistical tables follow each summary. Under various large topics, subtopics are summarized:

The School Board

"Number of members.—The consensus of opinion is that a small board of education can work much more effectively than a large one. Few, if any, authorities on school administration favor a board of education of more than nine members."

"How chosen.—Most authorities. . . . favor the election of school board members by popular vote. Some . . are not opposed to appointment by the mayor, especially in large cities."

"Length of term.—The prevailing opinion is that school-board members should be elected for a long term, so that there may not be a complete change in the personnel of the board every two or three years. A five-year term would more nearly meet with the approval of authorities on school administration than a three-year term."

"District from which elected or appointed.—It is doubtful whether any one who has made a study of city school administration would advocate the election or appointment of school-board members by wards. . . . The ward system has almost disappeared."

"When elected.—Authorities on city school administration advocate that the members of an elective board be elected at a special school election and on a non-partisan ticket; or, if they are elected at a general city election, the names of the candidates for school-board membership shall not appear as belonging to certain political parties."

"Relation to the city government.—Authorities on city school administration are of the opinion that the city schools of the country should be managed by a board of education in no way dependent upon the city officials for funds, but by a board with large powers and with power to levy its school taxes or to prepare a budget within statutory limits, the amount of which must be appropriated from the city funds, and to expend the fund appropriated without consulting any other body."

"The president of the board.—The president of the city school board is usually elected by the board."

"The secretary or clerk of the board.—The school board secretary or clerk is seldom a member of the board."

The Superintendent of Schools

"By whom elected.—A fundamental principle of school administration is that the superintendent of schools shall be appointed by the city board of education. If the superintendent is elected by the people, the office is at once thrown into city politics, and no one not a resident of the city would be likely to be elected. A city should have the very best superintendent of schools its financial condition can afford. The board of education should scour the country in search of the best man."

"Term of office.—Obviously, the first term of office of the city superintendent of schools should be sufficiently long to give him time to show what he is able to do. A probationary period of one year is not sufficient. No superintendent, however clearly he may see the needs of a school system, can accomplish much the first year. A probationary term of three years is the least that will give a superintendent opportunity to make such changes as may seem necessary and time enough in which to prove that the changes have been for the best interests of the children."

"Duties of the superintendent of schools.—The chief duty of a city school superintendent should be to act as the head executive officer of the board of education. As shown in another part of this study, the executive authority is in some cities divided between the superintendent of schools and the business manager, the superintendent of schools being responsible for the educational phase and the business manager for the business phase of administration. If the two could be entirely separated, this plan of administra-

tion would have merit; but, as a matter of fact, the educational and business phases can not be independent of each other."

The Business Manager

"In those cities where the business manager is responsible directly to the board and not to the board through the superintendent of schools, a principle of school administration is clearly violated. . . . Unless the superintendent of schools has general direction of the ordering of textbooks, supplies, and the like, there may be delay, and the work of the schools suffers, or possibly the wrong kind of supplies may be ordered if the business manager is independent of the superintendent. If the superintendent is to be held responsible for results in the classroom, he should have authority to see that all supplies are of the proper kind and that they are delivered on time."

Elementary School Principals

"In cities having large elementary school buildings the plan of having a supervising principal in charge of each building is generally advocated and practiced."

Supervisors

"The problem of the relation of general and special supervisors of instruction to the elementary school principal is one that has not been entirely solved. If, as is contended by many, the elementary school principals should be supreme in their buildings in all matters of supervision of instruction, the question arises as to the position of the general supervisor."

"Certain Practices in City School Administration" is an 18-page pamphlet, catalogued as "City School Leaflet No. 29." Copies are available from the Superintendent of Documents, Washington, at 5 cents each.

The Touch of the Magic Wand

Beauty-Spots Take the Place of Unsightly Dumping Grounds in Denver

By JOSEPH C. COYLE

ONE of the outstanding features in the development of Denver is the evolution of Cherry Creek and its banks from a dumping-ground for rags, tin cans and all kinds of unsightly refuse, to one of the most beautiful driveways in the city. It is interesting to view portions of this strip, reaching half across the city, as it was twenty years ago, and as it looks today. Though the metamorphosis has been spread over this period of years, the finishing touches having just been given to one small spot during the past two years, there is probably not a citizen of Denver today who would say that the $650,000 which it cost could have been put to better use.

Though early settlers were warned by the Indians of the treacherous nature of this stream, the first real agitation for reclamation and flood prevention was brought about by the loss of city hall records and property deeds in the quicksands, during a freshet in 1864. Nothing but talk resulted, however, until 1906, when the first ordinances, creating special assessment districts, for the improvement of the creek and adjacent lands, were passed through the efforts of Mayor Speer, during whose tenure of office most of the work was done. These ordinances met with strong opposition at the time they were before the Council, but even those who opposed the plan are now agreed on its lasting benefit to the city.

The work involved the removal of many old buildings which stood on the land purchased for improvement, the construction of concrete retaining walls on each side of the stream, and the dredging of its bed, filling an 80-foot roadway on each side from the residue. This proceeding, which was accomplished by a steam dredge at the rate of 500 yards per day, eliminated a considerable expense for dirt. The retaining walls were constructed by contractors, and are all standing in good condition today, after several raging floods have tested their strength and efficiency. A great deal of property damage would have resulted from these floods, had it not been for the walls.

When Mayor Speer went out of office, in 1912, the creek had been walled from Blake to Downing Streets, and the boulevard constructed and parked, on the northeast side of the stream. The driveway on the west of the creek, called Cherry Creek Drive, had been graded and curbed for several blocks. The latter drive is constructed of poured tar macadam, while the boulevard is of concrete, with asphalt surfacing. Modern concrete bridges now take the place of the old wood and steel ones.

Since that time the drive has been completed, and the finishing touches added to the Sunken Garden, one of the beauty-spots of Denver, and the pride of the western portion of town. About half of this sunken park is given over to a natural park, with many trees and wild bushes, while in the other half is the concrete pool, filled by water piped from the creek, with a Florentine arch pavilion on the west, and surrounded on the east, north and south, by spacious lawns, shrubs and flower-beds. This portion of the park is five feet below street level.

Zoning and the Automobile as Factors in Slum Elimination

IN a recent address, W. C. Rice, Secretary of the City Planning Commission of Pittsburgh, and Chairman of the Housing Committee of the Pittsburgh Federation of Social Agencies, discussed the good effects of proper housing on the community and the relationship of zoning ordinances and of the increased use of automobiles to slum eradication. Pittsburgh's new Department of City Development was also mentioned as a potential factor in the solution of local housing problems. To quote in part:

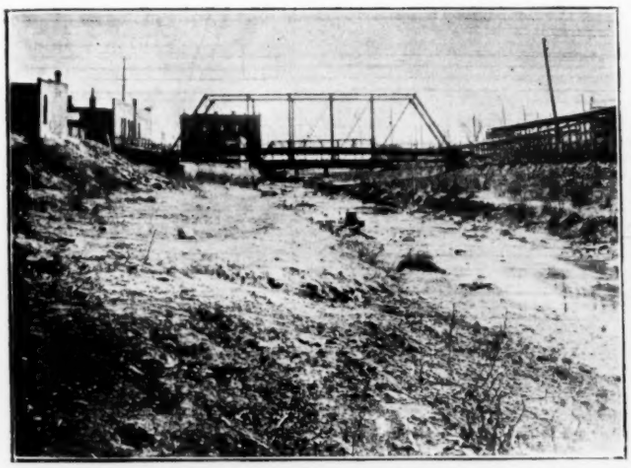
"Zoning properly applied will gradually eliminate the slum district with its evils of congestion and disease, and its reasonable enforcement has already improved conditions in Pittsburgh to some extent. A striking example of how a congested district may be eliminated by the enforcement of zoning regulations is found in the district on the North Side of Pittsburgh which was most seriously affected by the recent gas explosion. There are city blocks there with the corner lots entirely covered with commercial buildings, five to six stories in height and with interior lots (some only 14 feet wide) having dwellings built out to the street lines on each end with scarcely any rear-yard space. What little there is in some cases is largely occupied by outside toilets. The circulation of light and air for these dwellers is very poor and the lack of sufficient yard space practically compels the drying of clothes in the kitchen, with its tendency to dampen the whole house. The zoning ordinance has classified these blocks for light industrial use, and thus if the law is enforced, any new dwellings erected or any reconstruction of existing ones must result in much better housing conditions than before the catastrophe.

"The increased use of the automobile by the wage-earners, extension of trolley lines, improved highways, and reduction of working hours per day, have contributed to the improvement of the housing situation. It is no longer necessary to live within walking distance of the place of employment where odors, dust, noise and vibration are frequently found.

"Through the efforts of our energetic and aggressive Mayor, Charles H. Kline, a bill was enacted during the last session of the Pennsylvania Legislature creating the Department of City Development of Pittsburgh, having the powers to make surveys of and, subject to the approval of Council and Mayor, supervise and regulate the housing conditions in the city. This new department is also authorized to make such recommendations to the Mayor and Council as it shall deem proper for the improvement and development of the facilities for housing of persons and for the encouragement and development of industries in the city."

BEFORE and AFTER

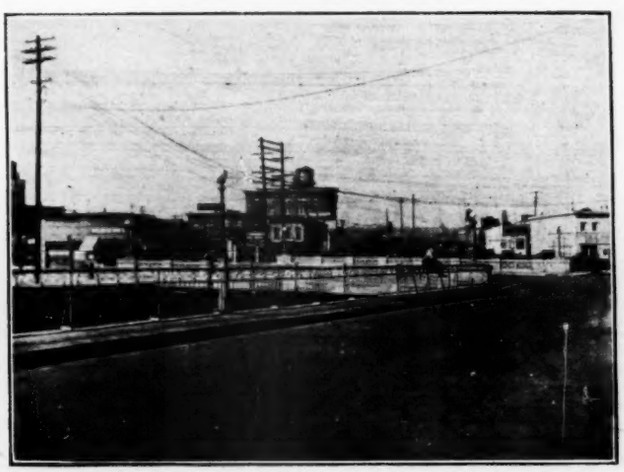
How Denver Has Converted Cherry Creek from an Unsightly Open Drain, Subject to Extensive Overflowing, to a Walled Stream Lined by Boulevards and Spanned by Handsome Bridges



TYPICAL VIEW OF THE STREAM BED BEFORE RECLAMATION BEGAN. OLD BRIDGE AT WEST COLFAX, SPEER BOULEVARD AND SANTA FE DRIVE

VIEW OF SAME SECTION TODAY, SHOWING NEW CONCRETE BRIDGE, PAVED BOULEVARD AT LEFT, AND TREES AND SHRUBS ALONG RETAINING WALL

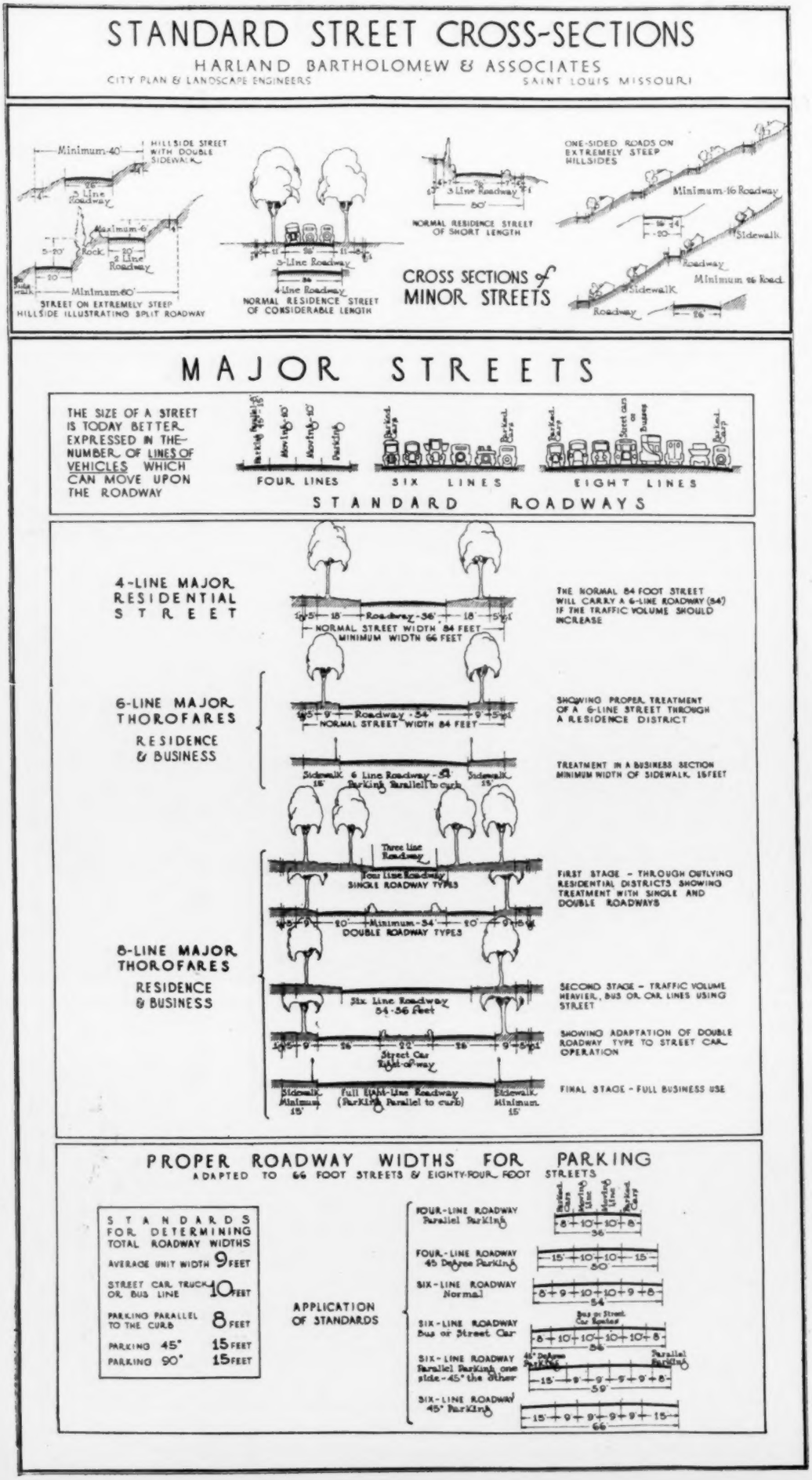
FORMER APPEARANCE OF STREAM BANK AT FOURTEENTH AND BLAKE STREETS



THE SAME LOCATION TODAY, WITH RETAINING WALLS AND NEW CONCRETE BRIDGE

SCENE AT TWELFTH AND ARAPAHOE STREETS TWENTY YEARS AGO. WALLS HAD JUST BEEN BUILT

THE TREE-LINED BOULEVARD ALONG THIS PORTION OF THE STREAM, TWENTY YEARS AFTER


STANDARD STREET CROSS-SECTIONS
HARLAND BARTHOLOMEW & ASSOCIATES
CITY PLAN & LANDSCAPE ENGINEERS
SAINT LOUIS MISSOURI
Minimum 40'
HILLSIDE STREET WITH DOUBLE SIDEWALK
2 Line Roadway
Maximum 6
Rock
2 Line Roadway
Minimum 60'
STREET ON EXTREMELY STEEP HILLSIDE ILLUSTRATING SPLIT ROADWAY
3 Line Roadway
4 Line Roadway
NORMAL RESIDENCE STREET OF CONSIDERABLE LENGTH
3 Line Roadway
NORMAL RESIDENCE STREET OF SHORT LENGTH
CROSS SECTIONS of MINOR STREETS
ONE-SIDED ROADS ON EXTREMELY STEEP HILLSIDES
Minimum 16 Roadway
Sidewalk
Roadway
Minimum 16 Road
Sidewalk
Roadway
MAJOR STREETS
THE SIZE OF A STREET IS TODAY BETTER EXPRESSED IN THE NUMBER OF LINES OF VEHICLES WHICH CAN MOVE UPON THE ROADWAY
FOUR LINES
SIX LINES
EIGHT LINES
STANDARD ROADWAYS
4-LINE MAJOR RESIDENTIAL STREET
Roadway - 36'
NORMAL STREET WIDTH 84 FEET
MINIMUM WIDTH 66 FEET
THE NORMAL 84 FOOT STREET WILL CARRY A 6-LINE ROADWAY (54') IF THE TRAFFIC VOLUME SHOULD INCREASE
6-LINE MAJOR THOROFARES RESIDENCE & BUSINESS
Roadway - 54'
NORMAL STREET WIDTH 84 FEET
SHOWING PROPER TREATMENT OF A 6-LINE STREET THROUGH A RESIDENCE DISTRICT
Sidewalk 15'
6 Line Roadway - 54'
Parking Parallel to curb
Sidewalk 15'
TREATMENT IN A BUSINESS SECTION MINIMUM WIDTH OF SIDEWALK 15 FEET
8-LINE MAJOR THOROFARES RESIDENCE & BUSINESS
Three Line Roadway
Four Line Roadway
SINGLE ROADWAY TYPES
FIRST STAGE - THROUGH OUTLYING RESIDENTIAL DISTRICTS SHOWING TREATMENT WITH SINGLE AND DOUBLE ROADWAYS
Minimum - 54'
DOUBLE ROADWAY TYPES
Six Line Roadway 54-56 Feet
SECOND STAGE - TRAFFIC VOLUME HEAVIER, BUS OR CAR LINES USING STREET
Street Car Right-of-way
SHOWING ADAPTATION OF DOUBLE ROADWAY TYPE TO STREET CAR OPERATION
Sidewalk Minimum 15'
Full Eight-Line Roadway (Parking Parallel to curb)
Sidewalk Minimum 15'
FINAL STAGE - FULL BUSINESS USE
PROPER ROADWAY WIDTHS FOR PARKING
ADAPTED TO 66 FOOT STREETS & EIGHTY-FOUR FOOT STREETS
STANDARDS FOR DETERMINING TOTAL ROADWAY WIDTHS
AVERAGE UNIT WIDTH 9 FEET
STREET CAR, TRUCK OR BUS LINE 10 FEET
PARKING PARALLEL TO THE CURB 8 FEET
PARKING 45° 15 FEET
PARKING 90° 15 FEET
APPLICATION OF STANDARDS
FOUR-LINE ROADWAY Parallel Parking
FOUR-LINE ROADWAY 45 Degree Parking
SIX-LINE ROADWAY Normal
SIX-LINE ROADWAY Bus or Street Car
SIX-LINE ROADWAY Parallel Parking one side - 45° the other
SIX-LINE ROADWAY 45° Parking

AN EXPLANATION BY HARLAND BARTHOLOMEW

(from whose recent Knoxville report the accompanying diagram of Standard Street Cross-Sections is reproduced):

Experience has shown that major streets should be either four-, six- or eight-line thoroughfares.

Minor streets should normally be designed for three lines of traffic. In exceptional cases where topographic conditions make it extremely difficult to construct roadways, two-line thoroughfares may become necessary.

Nine feet has become the more or less accepted standard as the unit of width for moving vehicles and eight feet for parked vehicles except where street cars or busses are expected. For these latter, ten feet should be the unit, while on high-speed thoroughfares, such as state highways, ten feet should be the unit width for all vehicles. Disposition of additional street widths for planting and for sidewalks will depend entirely upon the individual conditions to be met upon any given street.

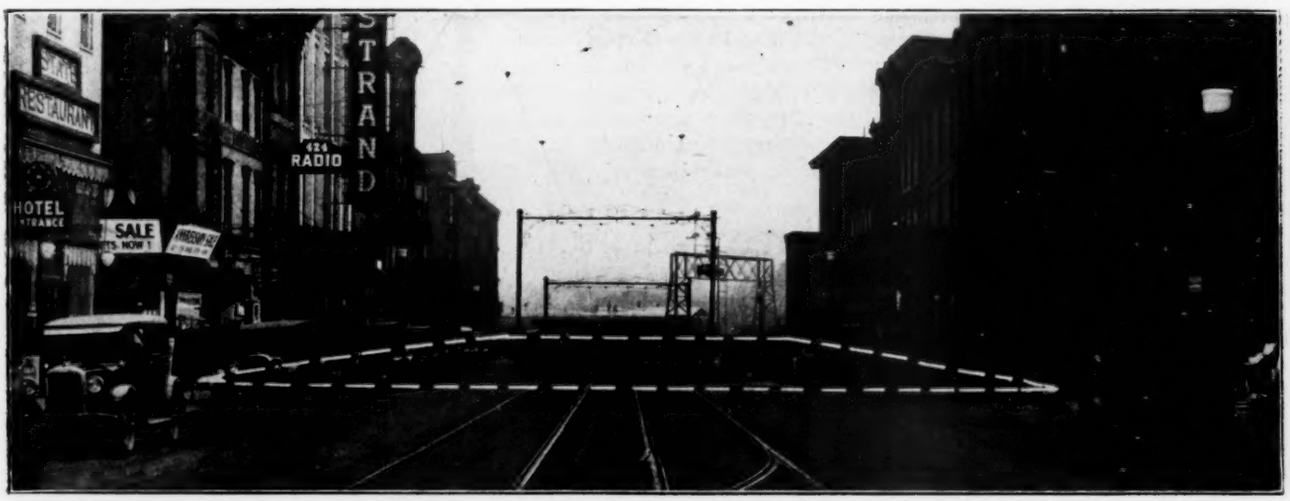
How a Chamber of Commerce Popularized a Large Bond Issue for Traffic Relief, Grade-Crossing Elimination, Sewers and Paving

By DANIEL N. CASEY

NOVEL, dramatic methods to convince the average voter that he should share a municipal bond issue of $1,250,000 were adopted by the Chamber of Commerce of Harrisburg, Pa., in connection with the project visualized in the accompanying pictures and other needed public improvements. So successful were these means that the greatest vote ever accorded such a proposition resulted and voters declared for the loans seven to one.

The bond issue campaign was merely the culmination of years of effort on the part of civic organizations and municipal authorities to gain common agreement among public utilities, and city, county, and state administrations, in the adoption of a plan and pro rata expense for the elimination of grade crossings, the widening of the subway beneath the main line of the Pennsylvania in the heart of the business district, the razing of buildings, and other work incidental thereto. Also, the city needed new sewers and additional funds for paving at street intersections, and the city's quota for the subway widening and the grade-crossing elimination was added to the amount needed for the other two improvements.

The Public Service Commission issued an order apportioning the charges. The share of the city was $887,215, and the county's share was $355,965. Since Harrisburg is the county-seat and the only city in the county, its people are therefore obliged to share in both of these. The Chamber of Commerce, having taken the leadership in stimulating the desire for these improvements, was then faced with the problem of selling



MARKET STREET SUBWAY BENEATH THE MAIN-LINE TRACKS OF THE PENNSYLVANIA RAILROAD IN THE HEART OF HARRISBURG
By concerted community action this restricted, crowded curving tunnel will be converted into a six-way traffic line the full width of the street

Courtesy of Harrisburg Patriot-News

HOW THE WIDENED MARKET STREET SUBWAY, CARRYING THE TRAFFIC IN THE PRINCIPAL THOROUGHFARE OF HARRISBURG, WILL LOOK AFTER ITS ALTERATION

the idea to Mr. and Mrs. Voter.

What the Chamber did to popularize the loans for the few weeks immediately preceding the general elections was, however, only the climax of its program. For four years it had been laying the groundwork for this very effort. At its neighborhood meetings, by publicity, by special articles in its house organ, and by addresses of committee chairmen, it had been stressing the urgent necessity for wider and free arteries in Harrisburg over which its trade and business could move.

A special Improvement Loans Committee was named and divided into several groups. The Publicity Committee was headed by a man who is a past president of the Chamber, is general manager of the theaters, a former newspaper man, and one who is close to the pulse of public opinion. Under his direction a keen-cut movie of about 500 feet, depicting present conditions and the advantages of improvements, was taken and shown in all the city theaters. Each item was dramatized and each appeal vivid.

Dramatizing Traffic Congestion in Motion Pictures

The present Market Street Subway is a right-angle turn only 24 feet wide into which pours the traffic from a main artery 80 feet wide carrying two street-car tracks. The congestion and delays at busy times are obvious. Chairman Hopkins, with the assistance of the Police Department, stalled an automobile across both street-car tracks in the center of the subway and let the traffic pile up. Then he backed up a truck on which was mounted the movie machine and let the reels depict the chaos. As a comparison, he then went to another section of the city where a subway the full width of the street has been completed, and with a few feet of film pictured the contrast.

The next scene, urging the elimination of grade crossings, had an even higher effect. When a draft of freight cars was pulled over the crossing and traffic halted, the camera showed the large number of trucks, pleasure cars, vans, and vehicles of every description panting at the delay. Then the Chairman got two fire companies, showed them racing from their houses and held up at the end of this traffic tangle, the firemen impatient, the sirens sounding, the bells clanging. This was run without any comment except one line—*"Supposing your house were on fire?"*

A muddy quagmire in the vicinity of one of the high schools, through which pupils would have to walk during inclement weather, showed the necessity for the paving loans.

Twenty-foot canvas signs were erected by the Chamber in the subway and near the grade crossings. These carried short but effective sentences such as—

"Rip Out This Hole"
"Tear Out This Trench"
"Vote for the Loans"

Business clubs cooperated heartily. Under the direction of the Chamber, they sent traveling minstrel shows and four-minute speakers to twenty industrial establishments. Speakers were also sent to the schools. Through the Chamber offices nearly 150 different newspaper stories were prepared dealing with different factors of the bond issue. Over 100 interviews with various types of people were secured and printed.

When the matter of handling the stories was under consideration, reporters developed the fact that many people in industry were taking the position that if the Chamber of Commerce endorsed the loans they were meritorious. This not only was decidedly encouraging to the Chamber, but proved its good will among the people.

Harrisburg Has Become Accustomed to Big Public Expenditures

Harrisburg long has been known as one of the cities among the forefront in the American municipalities for the development within itself. It has more acres of parks than any other city in the state except Philadelphia and Pittsburgh; it has nearly 125 miles of fully paved streets, and 100 miles of sewers in a total area of 9 square miles. It has developed its river front to be a panorama of beauty with a park flanking the Susquehanna basin and granolithic steps extending into the water. It is now taking another big step forward. The city and state are collaborating in the erection of a viaduct over the Pennsylvania tracks in the rear of the State Capitol which will provide a new artery to the east. With the elimination of the grade crossings, and the widening of the subway, the doubling in width of the privately owned Market Street bridge, with the completion during 1927 of the greatest program of street paving of any year in the twenty years past, with the development of a new civic center in its uptown section, Harrisburg is keeping pace with the trend of the times.

Perhaps the most pleasing feature in all of this is that the citizen himself has responded. He has made possible many of these great improvements by his acquiescence in bond issues and his willingness to approve capital expenditures when he is convinced that these are justified and will keep Harrisburg in the vanguard of advancement.

Three Essentials for Effective Control of Pedestrian Traffic

THREE requirements essential to the success of regulations designed to control jaywalking and prevent the congestion and danger arising from the conflict between pedestrians and vehicles at intersections are outlined in a recent report by the Albert Russel Erskine Bureau for Street Traffic Research.

"Primarily, the regulations must appeal to the public as being reasonable," states the report, prepared by Miller McClintock, Director of the Bureau, which is endowed in Harvard University by The Studebaker Corporation. "Pedestrians will willingly wait at an intersection for their turn to cross, if, while they are waiting, traffic across their path is comparatively heavy and regular, at least sufficiently so to make crossing at the time appear to be difficult.

"When pedestrians are forced to wait at intersections during periods when there is no traffic to interfere with their immediate crossing, the entire system of regulation appears unreasonable. For the success of pedestrian control it is therefore necessary that traffic should be heavy, and that the flow of vehicles should be reasonably constant during the pedestrians' stop interval. This is naturally accomplished by keeping the stop and go intervals as short as possible—a requirement for good vehicular control as well as for pedestrian regulation. One of the chief faults at the present time of both automatic signal control and control by traffic police is the tendency to hold traffic for intervals that are unnecessarily long.

"In the second place, provision must be made for all pedestrians to reach the sidewalk before cross-traffic begins. When vehicle traffic is released without adequate warning, pedestrians who have been obeying the signals will often be caught in mid-street. Naturally, this leads to a disregard of regulations which place restrictions on pedestrian movement without offering the pedestrian an equivalent value in definite protection. Proper manipulation of the neutral interval will make it possible for all pedestrians to reach the sidewalk before vehicle traffic is released.

Finally, pedestrian control is a type of regulation which must be accepted voluntarily by the public. It is seldom successful when forced on by police power. To this end it is important that the traffic police should be thoroughly instructed in their duties before the system is put into effect, and it is likewise desirable that the public be carefully educated by a suitable campaign of publicity before pedestrian control is attempted."

No pedestrian has to be told that this is Leap Year.
—*Wichita Eagle.*

Iron and Manganese Removal at Wausau, Wis.

By EMIL FLATTER
SUPERINTENDENT OF WATER-WORKS, WAUSAU, WIS.

THE presence of iron and manganese in the city water-supply of Wausau, Wis., for many years made the water question a vexatious problem; not because of the question as to the safety of its use for drinking and other domestic purposes, nor from a sanitary standpoint in general, but because of the accumulation of iron rust on the walls of the mains and the clogging-up of service pipes. The iron rust deposits unfitted the water for any satisfactory use, causing the staining of linen in being laundered, the staining of cooking utensils and plumbing fixtures, and very seriously affecting hot water systems. No matter how wholesome or harmless the water was for table use, the muddy brownish red color disqualified it for the bath. All these grievances have disappeared since the operation of the aeration and filtration plant began.

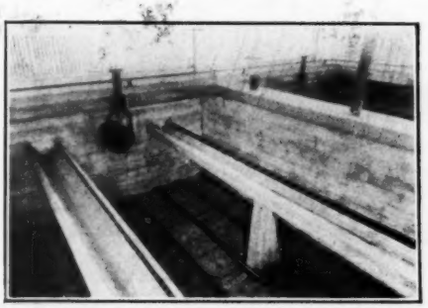
The Wausau aeration and filtration plant for the removal of iron and manganese differs only slightly in construction from the average water purification plant. It consists of aerator room, mixing chamber, clarifier, sedimentation basins, and six filter beds.

Source of Supply

The plant is operated in connection with the original pumping-plant situated near the bank of the Wisconsin River and constructed in 1885. The raw water is obtained from a group of wells ranging from 30 to 135 feet in depth and consisting of one 32-foot, three 24-inch, six 10-inch and four 6-inch wells. All the 24-inch wells are provided with screens from 60 to 90 feet in length, surrounded by a 2-foot gravel wall. The water from all the deep wells flows continually into a 36-inch header 18 feet below the surface, from which a 2,500-gallon-per-minute electrically driven centrifugal, low-lift pump and one 2,500-gallon-per-minute non-condensing steam turbine, placed near the supply, lift the ground waters to the filtration plant. The plant has been designed for 3,000,000 gallons minimum capacity which is capable of handling 4,500,000 gallons without difficulty.

The Plant

A plant covers a ground space of 83 x 143 feet. The main building is 35 x 143 feet and is three stories high, being built of concrete with a brick veneer and includes a 500,000-gallon storage reservoir in the basement. The first floor houses the two mixing chambers, six filters, a chemist's room, the back-wash pump of 4,500 gallons per minute capacity, the air-compressor, and the pipe gallery. The top floor is divided into the aerator room, storage room for chemicals, and the dry feed machines of the Bacharach type. The clarifier, 45 feet square by 16 feet deep, and three 36- x 45-foot sedimentation basins, each 14 feet deep, constitute an annex to the main building.



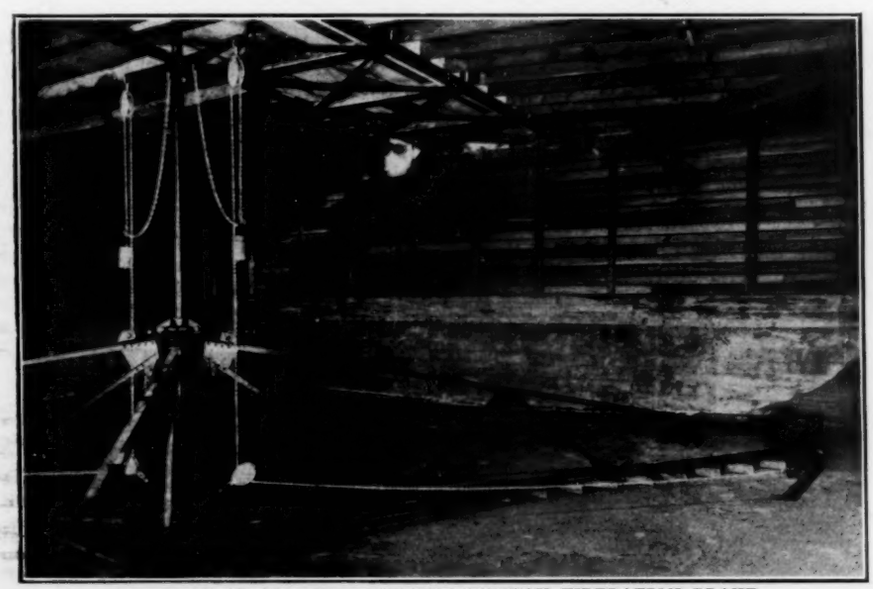
UNWATERED FILTER, SHOWING METHOD OF SUPPORTING GRAVEL AND THE WASH-WATER TROUGHS

Aeration and Clarification

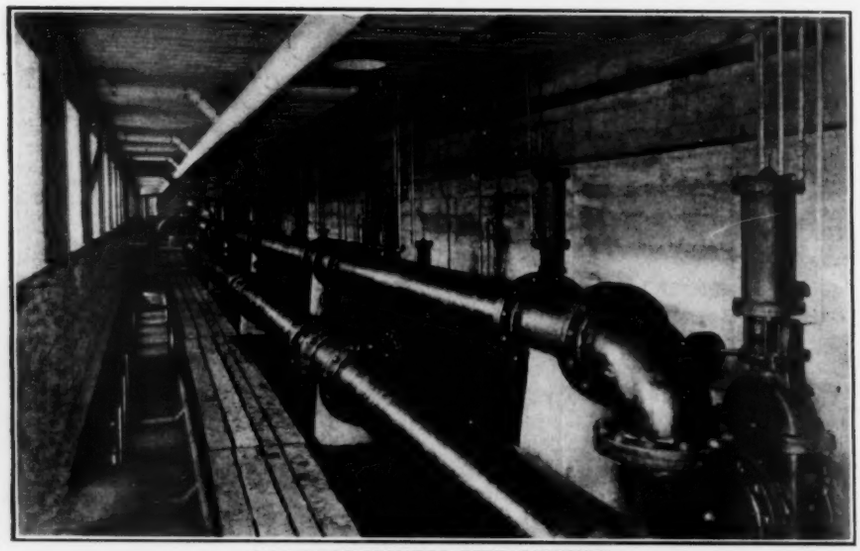
The ground water is lifted onto the concrete aerator racks, which have latticed woodwork bottoms, with side retainers of cypress. There are six of these racks, divided into four double sections with an air space of 24 inches between them. From a 4-inch horizontal water line, over the center of each of the six racks, the water is discharged through 200 ⅜-inch holes onto a 5-inch layer of coke overlaid by 2 inches of manganese dioxide ore. In passing downward from one bed to another, the stream is broken up and exposed to the oxygen in the air, which causes the iron to become oxidated, liberating the manganese. Just before the water leaves the aerator room, it is dosed with alum and hydrated lime, which are fed by automatic dry-feed machines. These two chemicals are discharged into separate containers to dissolve and thence run through a sluice channel into the mixing chamber, moving over and under the baffles toward the upper end of the mixing chamber into the clarifier.

The clarifier, which is of concrete 45 feet square by 60 feet deep, has a Dorr clarifier unit suspended in the center of the basin. The Dorr clarifier has a rake-like scraper reaching the full length across the basin, which slowly revolves, moving the sediment toward the center of the basin, where it drops out of the water and is pumped to the sewer. This revolving mechanism is driven by a 3-horsepower motor at a rate of one revolution every 12½ minutes.

The effluent from the clarifier flows over the edge of a spillway formed by one side of a 2 x 2-foot concrete trough running the entire length of the basin.



INTERIOR OF CLARIFIER AT THE WAUSAU FILTRATION PLANT



THE WELL-LIGHTED PIPE GALLERY

The effluent flows to the three sedimentation basins, each of which measures 31 x 45 feet in area and 14 feet deep. In these basins the final settling of the water takes place. Then the effluent flows on to another concrete trough with gate-valves for proper regulation to the filters.

Filters

The filters are built of concrete and consist of sections of porous concrete slabs, 6 inches in thickness, which have a penetration capacity of 150 gallons per minute per square foot. These slabs are bolted down to 4 x 4-inch concrete stringers and have the joints cemented. Coarse gravel from ¾ to 1 inch in size was used for the slabs. The filter medium consists of a layer of 6½ inches of ¾- to 1-inch gravel placed above the slabs, over which is another 3 inches of ⅜- x ⅝-inch gravel, and then a course of 3 inches of 3/16- to ⅜-inch gravel, surmounted by 28 inches of fine sand. The aggregate minimum capacity of the six filters is about 3,000,000 gallons daily. Five tests have demonstrated a maximum capacity of 5,000,000 gallons.

The filters are equipped with operating tables and the usual influent, effluent, sewer and back-wash water and valves, and loss of head gage. They are also provided with electric flow meters. The readings of all the meters are summed daily and a record kept of the total number of gallons of water filtered each 24 hours. The effluent from the filters flows to the clear-water storage reservoir through rate-of-flow controllers. The rate of flow may be increased at any time to take care of fire calls. Flow through the plant is entirely by gravity. The water-level in the storage basins is 12 feet above zero of the pressure pumps of the distribution system.

Back-Wash System Important

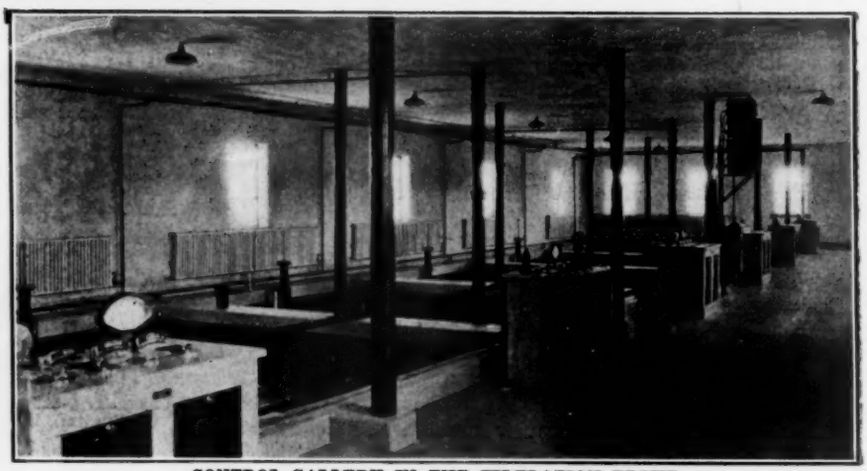
Considerable stress has been laid on the equipment for the back-wash system because of the sediment present in the treated water after sedimentation, which would clog the pores of the filter sand in a short time. A 4,500-gallon-per-minute motor-driven pump is installed on the cement floor over the clear-water reservoir. The supply is taken from the clear-water reservoir and forced through the filter from beneath the porous slabs, breaking up the filter material and lifting the turbid water into the concrete troughs which are built above the filter beds. From 2½ to 3 per cent of the total water filtered is used for back-washing.

Operation

When the new plant was put into operation no additional employees were necessary. The engineers of the high-pressure station, which is separated from the filter plant by a driveway, take care of the entire works in charge of the chief engineer.

As an example of the work of the plant, in the month of September, 1927, the total cost of operating the iron and manganese removal plant amounted to $862.50. A total of 41,113,622 gallons of raw water was raised from the wells to the aerators. This water was dosed with 40,000 pounds of alum at a rate of 7.4 grains per gallon, and 18,700 pounds or 3.5 grains per gallon of lime, and the total current used was 128,000 kwh. at a cost of $0.015 per kwh.

The new plant complete represents an expenditure of $125,000. It was designed by W. G. Kirchoffer, Madison, Wis. The construction work was done by Schafer and Olson, of Chippewa Falls, Wis., and all mechanical construction such as the placing of machinery, pumps and pipe fittings was done direct by the water department under the direction of the chief engineer of the pumping-station. A. L. Barnett, represented W. G. Kirchoffer as Superintendent of Construction.



CONTROL GALLERY IN THE FILTRATION PLANT

"Private Rights Cease When They Become Public Wrongs"

IN his book, "Industry and Humanity," characterized by the *Journal of the Town Planning Institute of Canada* in its December issue, as "one of the finest text-books for the underlying philosophy of town planning in existence," Premier Mackenzie King presents the principle stated above as the one underlying law and order in all civilized communities, and continues:

"It cannot be contended that what is a matter of grave concern to the public is a matter of exclusive concern to private parties. There is no right superior to that of the community as a whole. . . . Town planning and rural planning and development were almost unthought of a generation ago. Today they are subjects of scientific study, and compel the recognition of Government. It is to be hoped that ere long public opinion will no more tolerate the slum and the overcrowded tenement than it would tolerate plagues such as were prevalent a generation ago."

Rules for Land Subdivision

For All Property Inside the City Limits of Riverside, and Within Three Miles Outside Thereof, As Adopted After Public Hearing, Pursuant to the State Planning Act of California, December 2, 1927

1. Procedure for Subdividers

THE following steps are recommended to subdividers and engineers, to expedite approval of plats and street maps:

(a) Read the Map Filing Act (Chapter 163, Statutes of 1923, as amended), and the State Planning Act (Chapter 874, Statutes of 1927, particularly sections 12-21 inclusive).*

(b) First see the representative of the Commission in the Engineer's office for an informal discussion of the problems involved. Secure exact information as to any major traffic highways or other items on the Master Plan of the city affecting your property.

(c) Present to the secretary of the Commission at the City Hall, a preliminary layout in pencil, with two blueprints, showing approximately to scale (but without figured dimensions) everything to be shown on filing map. This shall be referred to the consultant by the secretary without waiting for a meeting and as soon as tentatively agreed upon by the consultant with the owner, the secretary is authorized (after consultation with the president and the consultant) to call a public hearing not less than 6 days later, as required by state law. While the Commission is now allowed 30 days by law for study of a proposed plat, only so much of this time will be taken as is reasonably necessary to check the plat and hold the required hearing.

(d) After hearing the report of the consultant and protests, if any, tentative approval of the Commission may be given to a plat, provided changes required by the Commission are made as noted in the resolution of tentative approval placed on the minutes.

(e) The tentative approval given by the Commission as above provided shall become final without further action by the Commission if and when a final filing plat is presented to the secretary, with all changes and modifications shown as requested by the Commission in the tentative approval, and all rules complied with as herein provided, and the secretary is thereupon authorized to signify such final approval by signing the form (indicated in section 4) on the plat, provided the city engineer or county surveyor, as the case may be, shall first have given his written approval thereto.

The subdivider shall file a vandyke negative and two white prints of each sheet of the final plat, as recorded, within ten days after recording, with the secretary of the City Planning Commission.

* The full text of the California Planning Act of 1927 is obtainable in book form, with helpful notes and references, at $1.50, from Charles Henry Cheney, Palos Verdes Estates, Calif.

Explanatory Statement to Readers of The American City

By Charles Henry Cheney
Consultant in City Planning

These rules for map filing are the result of several months' careful study of previous rules adopted in Riverside, Akron, Rochester and other cities, the splendid platting guide of Milwaukee, the Regional Planning Commission's rules of Los Angeles County, and the proposed rules for Sacramento. They are somewhat fuller than any of those above cited, in order to meet the requirements of the new California Planning Act, adopted by the 1927 Legislature, which is largely based on the Hoover Standard Planning Act, as recommended to all states in the spring of 1927.

Riverside has between 25,000 and 30,000 population. It was the first city in California to bring its Planning Commission under the new state act, and also was first in adopting a Major Traffic Street Plan, thus taking jurisdiction over subdivisions as that act provides. The map rules were prepared first by the Commission and then carefully gone over at a number of long conferences with local civil engineers, committees of the realty board, title companies, etc.

Only one requirement which the Commission would like to have made was finally omitted at the request of the realty board committee. That was that each subdivider must present a contour map of his subdivision. It would pay to have this done in every city.

Carmel, a California city of approximately 5,000 population, has also adopted the above rules, but increased the minimum area of residential lots that will be approved, to 7,200 square feet, or approximately 50 x 120 feet. This town was originally subdivided with 40-foot lots, which is now regretted.

2. Considerations in Approving Plats

The Planning Commission is required by law to take the following matters into consideration before approving subdivision maps or plats and the extension and closing, opening or changes in streets, parks or other public places:

- Arrangement of streets, walks, alleys, etc., in relation to the Master Plan of the city
- Provision for adequate and convenient open spaces
- Provision for traffic, utilities, access of fire-fighting apparatus, recreation and light and air
- Easements for building setback lines and utility lines
- Minimum width and area of building lots
- Street improvements to be installed
- Prospective character of development and relation to adjoining territory
- Dedication of streets, parks, playgrounds, or other areas, arcades and arching of streets, street tree planting, etc.
- Building restrictions
- Present zoning or changes in zoning contemplated
- Provision for the amenities of life

3. Preliminary Plat

In seeking to subdivide land into building lots and to dedicate streets, alleys, or other lands for public use, the owner shall submit two copies of a preliminary sketch plat to the City Planning Commission (which may be in pencil), before submission of final plat. The preliminary plat shall be 100 feet to the inch scale, or larger, and shall show:

(a) The boundaries of the property to be subdivided, section and half-section lines, public, municipal, school or county land boundaries, existing permanent buildings, watercourses, width and depth of lots, trees over 6 inches in diameter and other existing features within 150 feet of the outside boundaries of the property subdivided.

(b) The title and tract number under which the proposed subdivision plat is to be recorded, together with the names or name and address of the allotter, and the name and address of the person to whom notice of hearing shall be sent, and of his engineer.

(c) The property location and proposed widths of streets (with their names), alleys, the approximate per cent of grade of each street or alley, block by block, and plan for handling storm waters, easements, lots, building lines; and similar facts regarding existing conditions in the property and within 150 feet in every direction from the outside boundaries of the proposed subdivision.

(d) The Commission may require a contour map, showing contour intervals of 1 foot or more referring to city datum, and drawn on tracing cloth.

(e) Date, north point, and scale.

(f) A written statement or a zoning map, indicating proposed uses for which the various parcels are to be sold, should accompany the preliminary plan.

In large subdivisions, provision should be made for parcels suitable for open spaces, and also for community build-

ings, such as schools, churches, branch libraries and the like.

Tentative approval of the preliminary plan does not constitute an acceptance of the subdivision.

Tentative approvals of subdivisions will be effective for 90 days only. Tracts not recorded within this time must be re-submitted, and will be considered as new tracts.

Note: The purpose of requiring submission of a preliminary plat is to give the subdivider of land an opportunity to secure the judgment of the Commission regarding his scheme of streets and lots before he has carried the matter too far. The observance of this requirement may mean a considerable saving to the subdivider.

Two copies of the preliminary plat are required so that one may be corrected or altered by the Planning Commission and returned to the subdivider and the other retained in the files of the Commission.

4. Final Plat

A vandyke negative and two white prints of the final plat as filed for record shall be filed with the secretary of the City Planning Commission permanently. This plat shall be made to a scale large enough to show the details clearly (preferably 100 feet to the inch or larger); two or more sheets must be used if one does not give sufficient room to accomplish this end. The original shall be upon tracing cloth of good quality and the size of the sheets must be 18 by 26 inches or 13 by 18 inches.

Note: After a land subdivision plat in preliminary form has been checked over and approved by the City Planning Commission, the owner is free to have his final plat prepared. When this is finished, the original and duplicate as prescribed by law must be brought to the Commission. The final approval of the Commission is placed upon the original and it may be recorded. A negative of the recorded plat must then be made and delivered with two prints from this negative to the secretary of the Commission. These are then distributed among the files of the Commission and the city engineer. The size specified is for the purpose of conforming to the state law.

The final plat shall show:

(a) Consent of owner; certificate of county auditor and other certificates required by law; certificate of city engineer (if within city limits), or of county surveyor (if outside the city limits); that bond has been filed (when required); land to be dedicated for public use; and certificate of Planning Commission in the following form:

I hereby certify that this plat is as approved by the Riverside City Planning Commission at its meeting held on the ..... day of ....., 19..., with the proviso that said approval shall become null and void 90 days from the date of this certificate unless this plat shall have been filed for record in the office of the County Recorder on or before expiration of said 90 days.

Dated ..... day of ....., 19...

_____, Secretary,
Riverside City Planning Commission.

(b) The boundaries of the property; the lines of all proposed streets and alleys with their width and names; and of any other portions intended to be dedicated to the public use. In case of branching streets the line of departure from one street to another shall be indicated. Streets will be required to intersect one another at an angle as near to a right angle as is practical in each specific case.

(c) The lines of all adjoining properties; the lines of adjacent streets and alleys, with their width and names.

(d) All lot lines, and numbers for all lots and blocks; building lines, arcades and other easements with figures showing their dimensions.

(e) All dimensions, both linear and angular, for locating boundaries of subdivisions, lots, street and alley lines, easements and building line setbacks, and any other public and private use. The linear dimensions shall be expressed in feet and decimals of a foot.

(f) All monuments together with their descriptions.

Note: Granite or concrete monuments shall be placed within the boundaries of the plat so that all streets and lots may be located without difficulty. The standard approved by the Engineering Department of Riverside or the County Engineering Department of Riverside County or San Bernardino County shall be used, depending upon the location of the property.

(g) Title and description of property subdivided, showing its location and extent, points of compass, scale of plan, and name of subdivider and of engineer platting the tract; also classification of property under zoning law, if such exists.

(h) Profiles may be required of all streets and alleys where topography makes it advisable (40 feet horizontal scale and 4 feet vertical, or 50 feet horizontal and 5 feet vertical recommended). Major streets shall in so far as possible conform to the contours to avoid grades in excess of 3 per cent, unless special conditions make it advisable to alter this rule. Minor streets should avoid grades in excess of 5 per cent unless approval of a heavier grade be secured in advance from the Commission.

(i) Any private restrictions to be shown on plat or reference to them made thereon; and plats shall contain proper acknowledgments of owners and mortgagees accepting said platting and restrictions.

(j) A deed to fee of the streets, or other areas offered for dedication to the public on said plats, may be required to be delivered to the city or county, as the case may be, at the time of filing said plat.

5. Acre Subdivisions

Where the parcel is subdivided into larger tracts than for building lots, such parcels shall be divided so as to allow for the opening of major streets and the ultimate extension of adjacent minor streets.

Note: Owners of real estate on the outskirts of the city frequently wish to plat property in tracts somewhat larger than the ordinary city lots. These acre subdivisions or "small city farms," as they are often called, usually remain in that state only so long as it is possible to preserve their semi-agricultural character. Whenever the growth of the city seems to demand the cutting-up of the "small farms," the owners are quick to take advantage of the opportunity. Unless the tract originally has been laid out with the idea of being subdivided later, each individual goes about making a small subdivision of his particular holding without reference to the others. The result is generally the misplacement of streets, confusion among the lots and frequent squeezing of the land, which is detrimental to the community and very costly to rectify. This provision of the rules aims to secure consideration of the ultimate subdivision of every tract, regardless of the intermediate stages through which it may pass.

6. Relation to Adjoining Street System

(a) The arrangement of streets in new subdivisions shall make provision for the continuation of the principal existing streets in adjoining additions (or their proper projection where adjoining property is not subdivided in so far as they may be necessary for public requirements). In general, such streets shall be of a width at least as great as the existing streets. The street and alley arrangement must also be such as to cause no hardship to owners of adjoining property when they plat their own land and seek to provide for convenient access to it, and must provide for continuing a reasonable number of through utility lines.

Note: The requirement above is to prevent the creation of unnecessary and absurd jogs and offsets.

(b) In general, dead end streets are not desirable, but if provided, they should have a turn-around at the end, with a minimum radius of 30 feet, except that the Commission may permit less radius to be used and less width of street when in its judgment, topographical conditions necessitate it.

(c) No subdivisions showing reserve strips controlling the access to public ways or showing strips of land which will not prove taxable for special improvements, will be approved, excepting when the control and disposal of the land comprising such strips are definitely placed within the city's or county's jurisdiction under conditions meeting the approval of the City Planning Commission.

(d) In laying out subdivisions, due provision shall be made for continuing such existing streets of adjoining subdivisions as may be necessary for public requirements, by providing new streets of at least equal width to such existing ones, unless the Commission deems such width unnecessary.

(e) Streets will be required to intersect each other at as near a right angle as practicable.

7. Street and Alley Widths

(a) The widths and locations of major or traffic streets shall conform to the major street plan. In business zones the adopted major street width should be increased 10 feet on each side to provide for angle parking.

Note: Parking space is extremely valuable to business lots. Angle parking brings approximately 50 per cent more purchasing power to the door than parallel parking.

(b) The minimum width for minor streets shall be 54 feet, except that in cases where the topography or special conditions make a street of less width more suitable the City Planning Commission may modify the above requirements.

(c) The minimum width of an alley in a residential block shall be 20 feet. A diagonal cut-off shall be made at all acute and right-angle alley intersections, except at street lines, measuring not less than 10 feet in either direction from the corner cut-off.

(d) Where alleys are not provided, easements of not less than 5 feet in width shall be provided on each side of all rear lot lines and of side lines where necessary, for poles, wires, conduits, storm and sanitary sewers, gas, water and heat mains. Easements of greater width may be required along lines or across lots where necessary for the extension of main sewers and similar utilities. These easements should be continuous to the ends of blocks to connect up with adjoining blocks in the shortest direct line.

In locating utilities, sewers shall be located on the lot line of such easements and other utilities where indicated by the city engineer.

Note: Modern subdivision practice requires the placing of all poles and wires along the rear lot lines instead of on the street. It is often more economical to place sewers, especially trunk sewers, along these lines. For such purposes easements must be indicated upon the subdivision plats. The easement widths required above are generally accepted as a standard.

8. Blocks

(a) Blocks in general shall not be longer than 1,000 feet between street lines.

Blocks over 750 feet in length shall have a crosswalk near the center of the block. The right-of-way for such walks shall not be less than 10 feet.

Note: In the days of the horse-drawn vehicles it was customary to make blocks rather short. The automobile has made longer blocks unobjectionable and generally safer. Wider streets, however, are necessary so there may be a sort of compensation in each subdivision. The minor street can be made narrow in order that the major thoroughfares may be wide, and the number of cross streets and walks through a given area may be reduced and the space thus gained also added to the width of the principal arteries. To overcome the disadvantage of long blocks to pedestrians, crosswalks are needed.

9. Lots

(a) In all rectangular lots, and so far as possible in all other lots, the side lines shall be at right angles to the street on which the lot faces. Lots with double frontage shall be avoided.

Note: This is a requirement which should be especially emphasized. When lot lines are not at right angles to the street, there is confusion in the mind of the builder who wishes to use the lot. If he places his building parallel with the street, it stands askew across his lot, cutting down his space for a drive and making hedges and walks run at peculiar angles to the street. If he places his house square upon the lot, with its sides parallel with the side lines of the lot, his neighbor may do something different. If his neighbor follows his example, the houses stand in saw-tooth fashion along the street, the rear of each one exposed to the front of the one next to it. All this annoyance can be avoided if land subdividers will but give reasonable consideration to the interests of those who will make use of the property they expect to sell.

(b) Residence lots: The minimum dimensions for residence lots shall be 50 feet for width and approximately 120 feet for depth. In no case shall a lot contain less than 5,000 square feet in area.

Business lots: Are best in multiples of 45 or 60 feet front and should be as near 100 feet deep as possible. More depth will not be used and less is inadequate.

Note: It is not desirable to establish a standard size for all lots. The requirements of lot purchasers differ, the precedent already established in a certain district is hard to break, also the effect of topography upon platting cannot always be foreseen.

The Commisison directs attention to the importance of proper lot planning, and will enforce requirements which seem to be necessary to protect the public interest. The custom of platting 25-foot lots is productive of building conditions which are not a credit to the city.

The tendency to plat extremely deep lots should also be corrected. In the past a deep lot was required to keep such nuisances as horses and carriages as far from the dwelling as possible. However, in the present age an excessively deep lot is not particularly advantageous. This is especially true in districts where alleys have been left out. A lot 120 feet deep is adequate for all ordinary residential requirements, yet not so deep as to invite rear dwellings.

An over-intensive use of land generally brings about conditions that are detrimental, and the protection of the city from such conditions is a purpose of these rules.

Key lots, with other lots backing up to them, are to be avoided, as far as possible, and are subject to approval of the commission.

(c) Corner residence lots shall have extra width, sufficient to permit the maintenance of building lines on both front and side. In normal cases the width required will not be less than the amount of the established building line on the side street plus the irreducible buildable width and such side yard requirements as may be provided for by the zoning ordinance.

Note: It is desirable to promote a wider use of building lines in new subdivisions. The city has suffered in the past through the tendency of builders to crowd out to the street lines with stores and dwellings. It is impossible to make an attractive or well-built city under such conditions. A building line of at least 25 feet should prevail upon residential streets. At corners, especially where lots front upon side streets, the building line should be carried around the corner. The store or home on the corner lot should not violate the building line observed on either street, even though it may distinctly face only one street. The use of a larger lot at the corner is recommended as a means of correcting this condition.

(d) Residential lots on major street intersections and at all other points likely to be dangerous shall have a radius of 15 feet at the street corner.

Note: The reason for this provision is obvious. There is no more urgent need in American cities today than the adoption of roadway and street planning practice to the requirements of modern traffic. Sharp projecting curb corners at thoroughfare crossings are decidedly dangerous, to pedestrian and driver alike, due to the sweeping turn that quickly takes an automobile to the wrong side of the intersecting street. A rounding of the corner of each lot at a street intersection will not lessen the value of the lots but will make the roadway much safer.

10. Building Setback Lines

Building setback lines shall be shown on all lots intended for residential use of any character, and they shall not be less than required by the zoning ordinance covering this section. Outside the city limits the City Planning Commission will require building lines in accordance with the needs of each addition. Provision shall be made for all enclosed or covered parts of buildings to be set back of such building lines.

11. Grading of Streets

A grading plan may be required with the final plan, showing grades approved by the city engineer.

Note: The mere preparation of such a plan will often convince the developer of a tract that his scheme is impracticable and more costly than he realized.

12. Parks, Schools, Playground Sites, Etc.

In subdividing property, due consideration shall be given by the subdivider and the Commission to the dedication or reservation of suitable sites for schools, parks and playgrounds, so as to conform as nearly as possible to the Master Plan of the city and nearby areas. Such provision should be indicated on the preliminary plan in order that it may be determined when and in what manner such areas will be dedicated or acquired.

Note:—The opportunities for cooperation of the sort implied in the rule above

have scarcely yet been touched. Any subdivision of reasonable size is almost certain to have a church or a school in it at some time. A neighborhood park of at least twenty acres should be made available for development in each square mile of residential area; and a small park of at least one acre should be laid out for each ten acres of residential property. These incidental features of every residence district should be planned at the time the land is platted. A distribution of a portion of the selling value of these areas among the remaining lots will generally make it possible for the promoter of the subdivision to offer such areas at prices that will permit immediate acceptance. Small areas for parks, if of usable size, may, with profit to the subdivider, be dedicated free to the city. The advantages of the park may be capitalized in the sale of lots, and generally enough additional will be realized to more than pay the original cost of the land given to the city.

13. Street Names

Streets that are obviously in alignment with others already existing and named shall bear the names of the existing streets.

Street names shall not duplicate existing street names.

14. Change to More Restricted Use District

Wherever property is subdivided with the intention that it shall have a use more restricted than that designated on the Zone Plan, such use shall be stated either in an application for amendment to the zone ordinance or in a separate statement filed with the Commission.

Note: It is practically impossible in zoning unplatted areas to determine precisely the uses of property which will be most suitable to the district. The subdivider of the plat must be allowed some latitude. The purpose of the rule above is to permit him to request a change in the zoning regulations if he thinks a more restricted classification of his property more desirable.

15. General

Lots shall be designed for buildings and cut to fit sites. Avoid standardization and monotony, and use curved streets following contours as far as possible.

If the question of a railway grade crossing is involved, the plan of the subdivision will be considered in its relation to the probability of a future grade separation or other treatment, and may be required to conform to certain conditions in anticipation of such treatment.

Where the subdivision is adjacent to a railroad right-of-way and the topography of the country or any zoning plans indicate that such property will be used for industrial purposes, highways in the same general direction will be required to be as nearly parallel with such right-of-way as practicable and at least one lot-depth distant therefrom.

Land zoned for industrial purposes shall be subdivided in large lots in accordance with industrial needs, as distinguished from being cut up into ordinary building lots.

Industrial territory, especially when adjacent to railroad facilities, should not be cut up into ordinary building lots, for after the installation of pavements, utilities, etc., suitable for this type lot, the overhead cost of improvement becomes too great for the property to be used for industrial purposes.

A subdivision is not merely a means for marketing land; it is far more, a process in community building. The fleeting economic effect of the act of selling soon gives way to the permanent, inexorable economic and social effect of the layout as a part of the form and life of the community.

No subdivision is too small to have character. It may be no more than the appropriate curving of a street, or the arrangement of the lots, or the skillful use of setbacks, or the planting scheme; but it may give to a mere linear design distinctiveness, life and charm.

Tree planting in new tracts is a duty, as well as a piece of good business, and every subdivider should have a definite planting plan, approved by the Board of Park Commissioners.

These regulations are adopted in the interest of developing better living and working conditions in and about the city of Riverside. They are made not only for the welfare of the future residents and lot owners, but also in the interest of the subdividers themselves. The cooperation of all engineers, subdividers and their agents is asked in making new developments fit into the Master Plan of the city and its environments.

RIVERSIDE CITY PLANNING COMMISSION.
Henry Coil, President.
Walter K. Lewis, Secretary.
Charles Henry Cheney, Consultant.

"Where Shall They Park?"

THAT the public welfare, and not the selfish claims of special interests lined up one against the other, must be the basis of any settlement of local parking problems—if they are to remain settled—is emphasized in a recent pamphlet of the National Safety Council, of Chicago, entitled "Where Shall They Park?"

No group of persons or interests are more vitally concerned with the parking problem than the business men in the congested districts of our cities. How are they affected by different kinds of parking restrictions? How are these restrictions adapted to different conditions? As a part of the National Safety Council's study, individual merchants and business associations were consulted as to their experiences with the parking problems that had confronted them and the solutions that had been promulgated.

The main conclusions from this study as set forth in the pamphlet follow:

"1. The safety of pedestrians and vehicles requires a clear view of traffic approaching from various directions at street intersections, and obstruction of view by vehicles stopped or parked at such points should be prohibited.

"2. To be effective, street-car safety zones must be used exclusively by pedestrians. This requires that the lanes of traffic between such zones and the adjacent curbs be kept clear of standing or parked vehicles.

"3. Double parking and the stopping of vehicles outside of street areas set aside for the purpose, often force overtaking vehicles onto street-car tracks or into the paths of other vehicles. This practice is unsafe and inefficient and should be prohibited.

"4. Fire protection is a public responsibility, and vehicles should not be permitted to park where they will interfere with free access to fire-hydrants and exit from fire-stations.

"5. Increasing demands upon street space by moving traffic often require the substitution of parallel for angle parking to increase the usable street width for traffic.

"6. All of the above regulations reduce the net available parking space upon the street, and, if such space is already limited, adjustments must be made to provide greater turnover in its use if the regulations are to be enforceable.

"7. The total number of vehicles that a given parking space can accommodate may be increased by providing one-half to one hour limit on parking time, but this involves serious problems of supervision and is seldom adequately enforced.

"8. It may then be considered necessary to prohibit parking during the late afternoon rush period to prevent undue congestion when traffic reaches its peak, but in some cities this may effect a reduction in the length of the shopping day and reduce the volume of sales in the congested business district.

"9. Prohibited parking during the early morning rush period helps to eliminate the all-day parker and is beneficial, permitting more frequent turnover in the use of parking space during the remainder of the day.

"10. Where the available parking space, under normal time limits, will accommodate only a small part of those who wish to use it, some or all of such space may be changed to loading or unloading zones where vehicles may receive and discharge passengers or merchandise but may not park. Parking capacity must, then, be provided elsewhere, such as in garages and on vacant lots, or the problem will merely be shifted to surrounding districts.

"11. Where the volume of vehicular traffic is so great that it is materially interfered with by vehicles in the act of getting into or out of space next to the curb, it becomes necessary to prohibit all parking and limit the use of the curb space to loading and unloading only. This increases the amount of unoccupied space along the curb so that the need for abrupt turning in leaving is greatly reduced."

Non-Bituminous Highway Materials and Their Uses—II

By A. T. GOLDBECK

DIRECTOR, BUREAU OF ENGINEERING, NATIONAL CRUSHED STONE ASSOCIATION

Bituminous Macadam

BITUMINOUS macadam construction was developed not so many years ago as a means for preventing the raveling which was taking place in our water-bound construction under automobile traffic. Such a road generally consists of a foundation course upon which is built a base course which in turn supports the bituminous macadam wearing surface. The foundation course is used in those localities where the subsoil is of comparatively low supporting value. Ordinarily, in its construction use is made of the most available local material which is suitable. For instance, such courses are often built of local gravel, sometimes to a depth of 18 inches. At other times local crushed stone is used which would not be suitable for the wearing surface because it is too soft. Frequently, large-size hand-placed stone is used, sledged to break up the more rounded pieces, rolled under a heavy roller and filled with either dry sand or stone screenings so that the surface voids are closed. Such hand-placed stone varies from a small size of perhaps 3 inches up to large stone of 15 inches in length. The base course ordinarily consists of crushed stone and, in certain localities, of crushed blast-furnace slag laid on the foundation course. If the subgrade is of a suitable nature, the foundation course is omitted. The size of stone for the base course is made to vary, depending upon the softness of the material available. It is wise to use a larger stone in both the base course and the wearing surface when the stone is soft, while a smaller stone may be used when the material is of the hardness of trap-rock.

Blanket Layer Under Foundation or Base Course

When either a hand-placed base or a crushed stone is used in the foundation course on a poor subsoil, it is of distinct advantage to interpose what might be termed a blanket layer between the subsoil and the foundation course. This may consist of a layer of fine sand or sandy gravel, stone screenings, etc. Its purpose is to prevent the upward intrusion of the clay into the voids in the stone, and thereby it prevents local settlement which might otherwise take place.

Base Course.—For stone of the hardness and toughness of trap-rock the base course material may extend from ½ to 2 inches in size, while with limestone having a percentage of wear between 4 and 6 per cent, better results will probably be obtained with stone from 2½ to 3½ or 4 inches in size. The per cent of wear of the stone in the base course should be not more than 8 and preferably 7 per cent.

Surface Course.—There are two general methods of constructing a penetration bituminous macadam, although the principle is the same in both cases. A bituminous macadam surface consists primarily of a rolled stone course with which bituminous material is incorporated by penetration methods.

The two general methods of procedure employed may be called the "double penetration" method and the "triple penetration" method. The details of these methods may be stated briefly as follows:

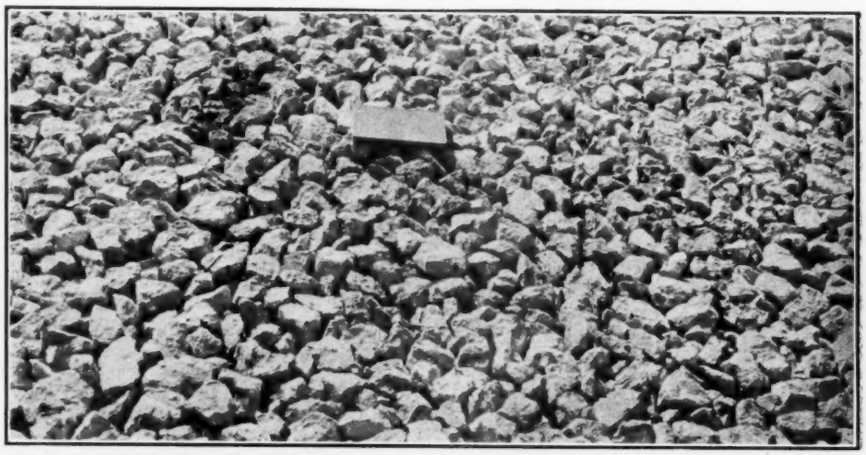


FIG. 4. STONE ON TOP COURSE OF BITUMINOUS MACADAM READY TO BE GIVEN PENETRATION OF BITUMINOUS MATERIAL

The uniformity of voids shows an ideal condition

Method I—Double Penetration Method

The following steps are carried out in this method:

1. The coarse stone, 1½ to 2½ inches or 1¾ to 3 inches, is spread uniformly between headers on the base course to the proper depth. A compacted thickness of 2½ to 3 inches is desirable.

2. Coarse stone is thoroughly rolled and compacted with a 10- to 12-ton roller.

3. Bitumen is applied uniformly with pressure distribution at the rate of 1¾ gallons per square yard if 1¼- to 2½-inch, and 2 gallons per square yard if 1¾- to 3-inch stone is used.

4. Keystone, ⅝- to 1-inch* for 1½- to 2½-inch coarse stone, and ¾- to 1¼-inch for 1¾- to 3-inch coarse stone is applied to the amount of 1 ton per 40 square yards of surface when hard stone is used. This should be reduced when soft stone is employed.

5. Surface is thoroughly rolled to force keystone into surface voids and produce tightly compacted surface.

6. Second application of bituminous binder is given at the rate of ¾-gallon per square yard with hard stone and ½-gallon with softer stone cover.

7. Cover stone ⅜- to ⅝-inch or ⅜- to ¾-inch in size to the amount of 1 ton for 55 to 70 square yards, the latter figure for cover applied in the late fall. The larger size is for the use with larger-size coarse stone.

The above method is particularly applicable to bituminous macadam constructed with the hardest varieties of stone.

Method II—Triple Penetration Method

The following method is usually referred to as a double seal cost method. It is most used with the softer varieties of stone:

1. Spread 2½- to 3½-inch or 2½- to 4-inch stone uniformly to proper depth between header boards, using spreader devices.

2. Roll and thoroughly compact stone with 10- to 12-ton roller. Over-

* NOTE.—These sizes are best adapted to asphalt binder. Better results are said to be obtained when a smaller size (⅜- to ½-inch) is used with tar binder.

rolling which crushes stone should be avoided and shattered stone spots should be replaced and re-compacted. A compacted thickness of 3 inches is desirable.

3. Apply bitumen with pressure distributor at the rate of 1.5 gallons per square yard.

4. Apply ¾- to 1½-inch coarse covering or choke-stone at the rate of 1 cubic yard to 250 square yards of surface (1 ton per 194 square yards).

5. Roll before bituminous material hardens and continue rolling until solid compacted mass results.

6. A small amount of fine cover material of ½- to ⅞-inch stone should be swept over the surface to loosely fill surface voids.

7. Make second application of bituminous material at the rate of 0.5-gallon per square yard.

8. Broadcast just sufficient fine cover over the surface to prevent roller wheels from sticking.

9. Roll surface to thoroughly compact it. (Roller should be used on at least 5 days when the bitumen is soft.) Additional fine cover should be applied sparingly as required during the rolling. Total amount should not exceed 1 cubic yard to 240 square yards of surface (1 ton for 200 square yards).

10. Any voids left in top should be filled by brooming fine covering material over surface, and surplus should be swept off.

11. Apply third treatment of bituminous material at the rate of ⅓-gallon per square yard.

12. Cover with fine cover material at the rate of 1 cubic yard to 120 square yards of surface (1 ton per 100 square yards).

13. If heavy bituminous material has been used in the third application, the surface should be rolled after the application of fine cover.

This method gives suitable results when the softer stones are used.

The bituminous macadam type is one which when properly constructed has been found to give excellent service, even under very heavy traffic such as found on the Boston Post Road. Successful construction, however, involves the strictest attention to every detail if complete success is to be had with this method. Too frequently, greatly inferior inspection is the rule in bituminous macadam construction.

Mixed Macadam Construction

The mixed macadam construction as developed by R. M. Smith, Deputy Minister of Highways of Toronto, is a type which gives every promise of providing an excellent and economic wearing surface and well merits the attention of all road engineers. It is primarily a bituminous concrete made with crusher-run stone including the dust of fracture. The stone extends up to approximately 2 inches in size and is first separated on an intermediate screen or screens and re-combined in its original crusher-run proportions, the purpose of this procedure being to avoid segregation due to separation of the small sizes from the larger. The stone is mixed with 4½ to 5 per cent of asphalt in an ordinary pug mixer and laid and rolled while hot with a 10-ton roller. The following limits of the final mixture are specified:

	Per Cent
Passing 2 -inch—retained on 1 -inch	20 to 45
Passing 1 -inch—retained on ¼-inch	25 to 45
Passing ¼-inch	25 to 35
Per cent bitumen, 4 to 6	

This mixture is used in both the base course and the wearing surface, both of which may be 3 inches in thickness. It may also be used merely in the wearing surface, laid upon a suitable type of base. The base course is also sometimes laid upon a foundation course when the subgrade is of a nature demanding heavier construction. The foundation course may be any of the courses used in the construction of bituminous macadam and may consist of pit-run gravel, hand-placed stone filled with sand or screenings or filled crushed stone. The ideal stone for this purpose should preferably have a percentage of wear of not more than 5 and a toughness of not less than 8. These are the requirements ordinarily specified for bituminous concrete, and such a surface is to be regarded as being of the same nature and having to withstand the same kind of traffic as bituminous concrete.

Bituminous Concrete Construction

There are several grades of bituminous concrete which are used primarily as a wearing surface laid either on a concrete base or on a rolled stone base. These types may be classified:

1. Coarse graded bituminous concrete
2. Fine graded bituminous concrete
3. Cold mix bituminous concrete

Broken stone is the most widely used for these types of construction, although crushed slag and gravel have likewise been used. Both of these materials, however, have their disadvantages as compared with stone, the gravel, because of its rounded character, not having the mechanical bond and stability of the crushed stone aggregate, and the slag, because of its exceedingly high absorption, requiring a much higher percentage of bitumen, and its non-homogeneity making for extreme difficulty in obtaining the proper percentage of bitumen. Apparently the stone lends itself to the bituminous types of construction much better than either of the other two materials.

Coarse Graded Bituminous Concrete

Coarse graded bituminous concrete is usually laid to a compacted depth of 2 inches, and the mineral portion of such a mixture consists of stone, stone screenings, sand and mineral filler. The filler consists of either limestone dust or portland cement. The following is a typical grading of the mineral portion of the mixture:

	Per Cent
Passing 1½-inch and retained on ½-inch screen	40 to 60
Passing ½-inch and retained on ¼-inch screen	10 to 20
Passing ¼-inch and retained on No. 10 sieve	10 to 5
Passing No. 10 and retained on No. 40 sieve	12 to 6
Passing No. 80 at least 25 per cent of which should pass a No. 200 sieve	15 to 10
The balance should pass No. 40 sieve and be retained on No. 80 sieve	

The stone portion of such a mixture should extend from ¼- to 1¼-inch in size and should have the following specification limits:

	Per Cent
Passing ¼-inch screen	0 to 15
Passing ½-inch screen	25 to 75
Passing 1¼-inch screen	95 to 100

Such a mixture ordinarily has from 6 to 9 per cent of bitumen, and the idea of grading is to obtain the minimum percentage of voids. This mixture is laid on both a rolled stone base and a portland cement concrete base, and both bases have given good results when properly designed for the particular subgrade and traffic conditions to be encountered. A flexible base, such as rolled stone, naturally must be thicker than a concrete base. It is too often overlooked, however, that no constant relation can be expressed between the thickness of these respective bases as far as load-supporting properties are concerned, because of the great influence which subgrade support has, particularly on the rolled stone base. It is conceivable, for instance, that on a well-compacted subgrade, perfectly capable in itself of supporting loads, the rolled base need be no thicker than the concrete base, while, on the other hand, when the subgrade is of doubtful character, the resistance to bending offered by the concrete base permits it to be thinner than the stone base, which distributes the load to the underlying subgrade largely by virtue of its thickness. This point is too often ignored in making a comparison of respective pavement designs.

The stone for a coarse graded bituminous concrete preferably should have a percentage of wear of not more than 5

and a toughness of not less than 8. The same requirements apply to a fine-graded bituminous concrete, which generally contains stone varying in size from ¼- to ¾-inch graded as follows:

	Per Cent
Passing ¼-inch screen	0 to 15
Passing ½-inch screen	25 to 75
Passing ¾-inch screen	95 to 100

A fine-graded bituminous concrete, like the coarse-graded mixture, is prepared as a hot mix and ordinarily has the following composition:

	Per Cent
Passing ½-inch and retained on ¼-inch screen	5 to 10
Passing ¼-inch and retained on 10 mesh screen	11 to 25
Passing 10 mesh and retained on 40 mesh screen	7 to 25
Passing 40 mesh and retained on 80 mesh screen	11 to 36
Passing 80 mesh and retained on 200 mesh screen	10 to 25
Passing 200 mesh	5 to 11

The mineral constituents consist of broken stone, sand and limestone dust or other mineral filler, such as portland cement or other types of stone dust. This pavement likewise has been laid to a very considerable extent, but probably possesses no particular advantage over the coarse-graded mixture and, in fact, in some localities has given far more trouble from instability than the coarse-graded mixture. It is used under about the same circumstances as the coarse-graded bituminous concrete and is to be ranked as one of the highest types of pavements, well able to carry a high volume of traffic such as would be found in the vicinity of large cities.

Cold Mix Bituminous Concrete

One pavement of this class is prepared by first treating the mineral aggregate with petroleum naphtha. The asphalt cement is heated to approximately 270°, added to the mineral aggregate and thoroughly mixed with it, then, finally, powdered calcium oxide or calcium hydrate is added. Two mixtures are used, one for the bottom course of the pavement and one for the top course. The percentage of the respective materials used in these two courses is as follows:

Materials	Percentages: Bottom Course	Percentages: Top Course
Mineral aggregate	86.0 to 90.0	85.0 to 89.0
Filler	4.0 to 6.0	5.0 to 8.0
Asphalt cement	4.0 to 6.0	5.0 to 7.0
Lime	0.5 to 1.0	0.5 to 1.0
Petroleum naphtha	0.5 to 1.0	0.5 to 1.0

The coarse aggregate in the bottom course should conform to the following size requirements:

	Per Cent
Passing ¼-inch	0 to 5
Passing ⅝-inch	0 to 25
Passing 1½-inch	75 to 95
Passing 2 -inch	100

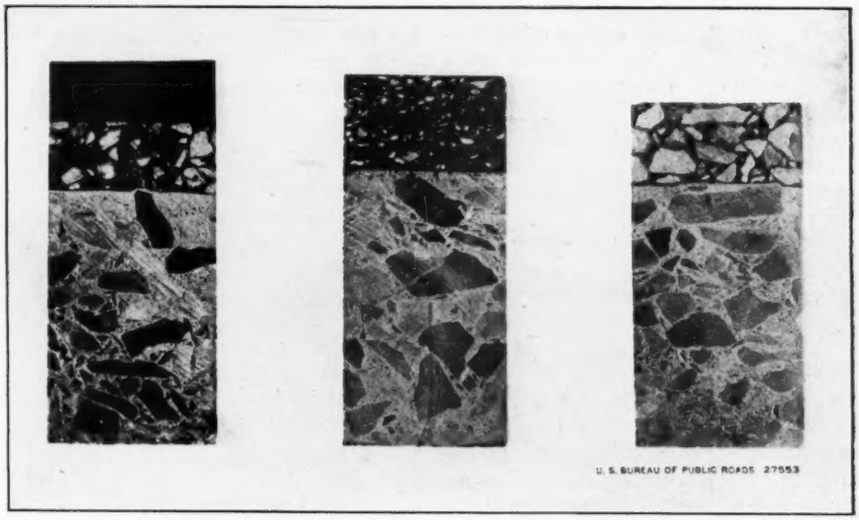


FIG. 5. CROSS-SECTION OF SHEET ASPHALT MODIFIED TOPEKA AND COARSE AGGREGATE BITUMINOUS CONCRETE ON A CONCRETE BASE

The coarse aggregate for the top course should be of the following size:

	Per Cent
Passing ¼-inch	0 to 20
Passing ⅝-inch	95 to 100

The filler mentioned above should consist of clean crushed rock screenings, all of which should pass a ⅛-inch screen.

This pavement, formerly a patented pavement, has the advantage of its being possible to lay it cold. The bottom course should be spread in a loose layer to something over 2 inches in thickness, and if the mixture is made of sandstone or limestone there should be approximately 164 pounds of mixed material per square yard of pavement; if of trap-rock, 168 pounds per square yard. After being spread uniformly, it is rolled thoroughly with a 10-ton roller. The top course, which is built to follow immediately after the laying of the bottom course and at no time more than 300 feet back of the bottom course, is laid to a depth of 1 inch. If of sandstone or limestone mixture, it should contain 73 pounds per square yard, and if of trap-rock, 75 pounds per square yard. After final rolling of the top course a surface cover material consisting of clean, dry, coarse sand or stone screenings, all smaller than ¼-inch in diameter, is spread in a thin layer over the entire surfacing, and again it is thoroughly rolled.

This type of pavement has given excellent results when laid upon a proper base and under careful supervision and is suitable for about the same type of traffic as carried by a coarse-graded bituminous concrete. In other words, when it is properly supported, it should be able to carry heavy trunk-line traffic.

Portland Cement Concrete

The fine aggregate most widely used in portland cement concrete is natural washed sand, but washed stone screenings of the proper size have also been used successfully. The coarse aggregate consists of either crushed stone or crushed slag or gravel, and at times bank-run gravel is likewise used. It is proposed in the following discussion to consider the effects of the various aggregates on the properties of the portland cement concrete slab.

When a portland cement concrete pavement is built, the ideal which the engineer would like to obtain is a finished slab of concrete having a smooth riding surface, capable of supporting the wheel loads of traffic no matter where they may be placed. He also wants his finished product to be a slab which will not crack excessively and which will not begin to scale and expose the coarse aggregate after being subjected to only a few years of service. He would also like to have the surface of the slab remain free of holes which may be caused by unsatisfactory fine or coarse aggregate.

Pit-Run Gravel for Aggregate

A practice which fortunately has almost completely disappeared, that of using pit-run gravel, is one which is to be strongly condemned for a number of reasons. In the first place, uniformity in the concrete is an ideal which most certainly should be sought in concrete road construction, because loads are apt to run on every portion of the slab and every portion should therefore have equal resistance to these loads. Concrete slabs are purposely designed with thickened edges in order that the edges may have as high a beam strength or

resistance to bending as any other portion of the slab. This design is based on the assumption that the concrete has uniform strength everywhere. If uniformity is not attained in the strength of the concrete, one of the fundamental premises underlying the design has been violated.

With pit-run gravel, uniformity in the cross-breaking strength of the concrete is very difficult to obtain, because of segregation of the coarse and the fine material. Moreover, the presence of excessive amounts of fine material in certain batches leads to excessive shrinkage upon drying-out of the concrete. Undue cracking under these conditions is apt to result. There is also the further danger of too much silt and clay existing in the sandy portion of the gravel, and this material has considerable to do with the formation of a weak surface layer of mortar, which is apt to peel off or scale in the course of time. It is quite true that pit-run gravel concrete roads have been built without such defects, but there is too much risk involved. A concrete road is a very expensive structure, of which the fine and coarse aggregates actually cost only approximately one-sixth of the total cost per mile. Well-prepared aggregates, even though they may cost double the amount of pit-run material, would increase the total cost of the road only 8 per cent, and it would seem unwise to risk the danger of failure with the use of such an uncertain material as pit-run gravel if well-prepared aggregates can be procured for so little extra cost. I would therefore strongly recommend against the use of pit-run material. I regard it as being uncertain and actually dangerous for use in concrete road construction.

Fine Aggregate

The fine aggregate for concrete roads should be carefully prepared. It should be composed of clean, hard, durable particles free from injurious amounts of dust, loam, soft, friable pieces, organic matter or other deleterious matter. When tested by means of laboratory screens and sieves, the fine aggregate should have the following grading:

	Per Cent
Passing No. 50 sieve	10 to 30
Passing ¼-inch screen	100

Weight removed by decantation, not more than 3 per cent.

When tested in comparison with Ottawa sand in the form of 1:3 mortar, it should show equal strength. When tested for organic matter in the standard colorimetric test, the color should not be darker than the standard color unless it complies with the Ottawa sand strength requirement. The above is not an ideal specification for sand, and better grading requirements could be written for local sands. It is important that the fine material as determined by the decantation test be kept under 3 per cent, for it is this material that causes surface scaling when present in too great an amount.

Stone screenings have been used in lieu of natural sand for fine aggregate in concrete roads, in which case, however, they have been washed free of dust. Even comparatively soft limestone screenings have been used for this purpose with excellent results. It is frequently the case that the available sand is very fine and screenings are added to produce a coarser grading. High strength results have been obtained in this way.

Coarse Aggregate

The coarse aggregates generally used are crushed stone, gravel and in some localities air-cooled, blast-furnace slag. Very creditable roads are built of all three of these materials when they have suitable qualities, but each aggregate has characteristics of its own. Blast-furnace slag is very porous and, as a rule, weighs not far from 75 pounds per cubic foot. The pieces, however, are not uniform in density and some of them are exceedingly light and float to the surface during the finishing operation and often give trouble in the proper finishing of the road. This is overcome to some extent by pre-wetting the slag and by delaying the belting of the surface. Slag also gives a pitted surface within a comparatively short time because of the breaking-down of the light pieces under traffic and weather. There have also been cases of unsound slags expanding within the course of several months upon their taking up of moisture. In these cases the moisture formed compounds having higher volume than the original compounds present in the slag, thus causing a tremendous expansive force and forming inverted craters in the road surface varying from a few inches up to perhaps 18 inches in diameter and several inches deep. This phenomenon is not the rule, it is the exception; but it occurs and there is no method now standardized for detecting the presence of such unsound particles. A suitable accelerated soundness test is needed for slag.

Slag Aggregate

The cross-breaking and compressive strengths of the slag concrete seem to be about equal to those of good crushed stone concrete. It, however, is more porous and seems to be more susceptible to expansion due to combined heat and moisture. Slag concrete bases under bituminous types of pavement are apt to give trouble due to their excessive expansion. When slag is used for concrete pavement construction, the physical requirements generally call for a weight per cubic foot of not less than 70 pounds. It is my personal view that such a weight limitation is inadequate as a specification for slag as a coarse aggregate in concrete, because commercial slags vary greatly in their physical properties as determined in the Deval abrasion machine even when they have the same weight per cubic foot. Moreover, the individual fragments are by no means homogeneous, and consequently, even though the average weight requirement of the specifications is complied with, the sample may contain a very high percentage of extremely light, porous pieces which readily disintegrate when exposed to traffic. This point may be cared for in writing specifications for slag, by specifying a minimum value for the apparent specific gravity. The use of the Deval abrasion test as modified and described in Bulletin 1216, U. S. Department of Agriculture, should always be specified.

Gravel Aggregate

Natural gravel, washed and screened, is widely used as a coarse aggregate in concrete, and unquestionably excellent concrete roads are built with this material. In many instances it is characterized by lack of homogeneity in its individual particles and, in consequence, gravel roads are more frequently pitted than those of stone. There seems to be a tendency also for more frequent cracks to form in gravel concrete than in stone concrete, judging from published discussions by engineers in various sections of the country. This trouble may be due to the release of bond between the smooth gravel surfaces and the portland cement mortar under the action of repeated loads and repeated expansion and contraction due to temperature and moisture effects on the concrete. It also may be due to the use of too small a gravel, which probably causes excessive shrinkage. It is also noticeable that spalling at the edges of cracks in gravel concrete roads is much more accentuated than in any other type. Gravel concrete, however, possesses the advantage that its smooth, rounded particles make for ease of finishing, which is offset to a considerable extent when the other aggregates are graded properly for maximum workability.

Crushed Stone Aggregate

Crushed-stone coarse aggregate has long been recognized in many localities as the most suitable coarse aggregate for concrete roads, and in several of the states it is given the preference over other aggregates. In North Carolina, for instance, although gravel is permitted, either the gravel concrete slab must be thicker or more cement must be used; in other states crushed stone is used to the exclusion of gravel. In

no case, however, has gravel been used to the exclusion of suitable crushed stone. It seems to be the case, as demonstrated by a number of comparisons, that crushed-stone concrete roads are cracking less than those made with gravel. This fact seems to be well brought out in the discussions of the report on reinforcing steel of the Highway Research Board of the National Research Council and is demonstrated on several test roads, notably the Ohio Post Road, built some twelve years ago and described in the June, 1925, issue of *Public Roads*. But crushed stone also has its faults. Sometimes it is unsound, and such stone should not be used. Sometimes it is too dusty, and this may accentuate the tendency to scale, and, as before stated, it must be carefully graded to produce suitable workability. However, in spite of these differences, creditable concrete roads have been built with all three coarse aggregates, and the following specifications for these materials should give suitable results:

Specification for Coarse Aggregate for Portland Cement Concrete Pavement and Base

Types and Grades

I. The material covered by this specification shall be supplied in the particular type (s) ordered by the purchasing department.

Type of Material
Broken stone
Broken slag
Gravel

Materials and Workmanship

II.

General Requirements

III. 1. Broken stone shall consist of clean, hard, tough and durable fragments of rock, free from soft, thin, elongated or laminated pieces, vegetable or other extraneous deleterious matter.

2. Broken slag shall consist of clean, hard, tough and durable fragments of air-cooled blast-furnace slag, free from soft, thin, elongated or laminated pieces, vegetable or other extraneous deleterious matter and reasonably uniform in density and quality.

3. Gravel shall consist of clean, hard, tough and durable particles of gravel, free from soft, thin, elongated or laminated pieces, vegetable or other extraneous deleterious matter.

Detail Requirements

IV. 1. Abrasion Loss

(a) The loss by abrasion shall be as follows:

	Per Cent
Stone, percentage of wear, not more than	7.0
Slag, percentage of wear, not more than	10.00
Gravel, percentage of wear, not more than	10.0

(b) The broken stone, when tested by means of laboratory screens, shall meet the following requirements:

	Per Cent
Passing ¼-inch screen	0 to 5
Passing 1¼-inch screen	40 to 75
Passing 2½-inch screen	95 to 100
Passing 3 -inch screen	100

2. (a) Broken slag in the size specified shall meet the following requirement:

Weight per cubic foot, not less than 75 pounds. It shall contain not more than 5 per cent by weight of fragments whose apparent specific gravity is 1.75 or less.

(b) Broken slag, when tested by means of laboratory screens, shall meet the following requirements:

	Per Cent
Passing ¼-inch screen	0 to 5
Passing ¾-inch screen	25 to 75
Passing 1¼-inch screen	95 to 100
Passing 1½-inch screen	100

3. Gravel, when tested by means of laboratory screens, shall meet the following requirements:

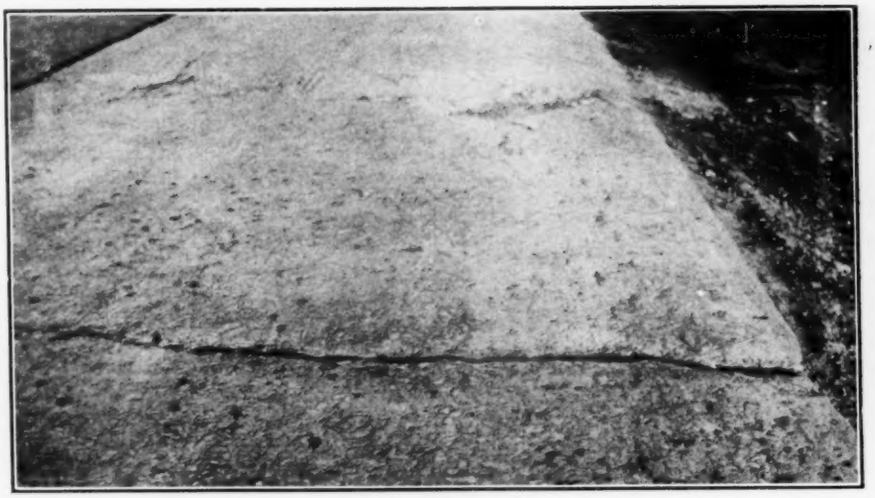


FIG. 6. APPEARANCE OF A CONCRETE SURFACE IN WHICH UNSUITABLE AGGREGATES WERE USED

	Per Cent
Passing ¼-inch screen	0 to 5
Passing 1¼-inch screen	40 to 75
Passing 2½-inch screen	95 to 100
Passing 3 -inch screen	100

Methods of Sampling and Testing

V. 1.

2. Tests of coarse aggregates shall be made in accordance with the following methods:

(a) Percentage of wear for stone and slag: A.S.T.M. Standard Method D2-08; A.S.T.M. Standards, 1924, p. 923.

Percentage of wear for gravel, Tentative Method Adopted by Amer. Assoc. of St. Hwy. Officials, 1917, See Bulletin 1216, p. 7, U. S. Dept. of Agriculture.

(b) Weight per cubic foot; A.S.T.M. Standard Method C9-21; A.S.T.M. Standards, 1924, p. 759.

(c) Mechanical analysis: A.S.T.M. Standard Method D18-16; A.S.T.M. Standards, 1924, p. 941.

It will be noted that the size of the blast-furnace slag has been reduced to 1½ inches. The reason for this reduction lies in the fact that slag, because of its non-homogeneity, produces surface pits in the concrete. By reducing the maximum size, these holes are kept to within a small diameter and are therefore much less likely to result in harm.

It is obviously impossible to speak of the many details in connection with the characteristics of non-bituminous materials for use in road construction in a paper of the present scope. Many materials have been omitted, including granite block for granite block pavements, and vitrified paving block, the cushioning material for these types of pavements and other materials of minor importance. Moreover, it has been necessary to speak in rather general terms, and the specifications given may have to be altered in some instances to suit local requirements. It is believed, however, that the requirements for non-bituminous materials given, if complied with, will result in the use of materials having suitable characteristics for the several types of construction.

ACKNOWLEDGMENT.—From a paper read before the Toronto Branch of the Engineering Institute of Canada.

Motor-Vehicle Registration Is Growing Much Faster Than Improved Highway Mileage

THERE were 40 motor vehicles registered in the United States in 1927 to every mile of improved highway of every type.

The comparative figure for 1926 was 34 motor vehicles to every mile of improved highway of every type.

The comparative figure for 1918 was 17 motor vehicles to every mile of improved highway, showing in the 10-year period an increase of 130 per cent in the number of motor units to every mile of improved highway.

In making public these figures on January 14, the American Automobile Association, acting on behalf of its 958 motor clubs throughout the country, called attention to the serious extent to which the American car builders and the car owners are crowding the road builders of the nation. The 1927 registration of motor vehicles was 23,125,000, and the improved roads totaled 575,000 miles.

"The tremendous increase in the ratio of automobiles to the mileage of improved highways," said Thomas P. Henry, President of the A. A. A., "constitutes a situation on which national attention must be kept constantly focussed if we want to keep car saturation at arm's length and if highway traffic is to move with a reasonable degree of dispatch and safety. . . . Our car producers and car buyers are crowding our road builders; the ratio of car increase from year to year is much higher than the ratio of improved roads, all of which spell increased congestion and the inevitable diminution of the open driving space on our roadways.

"The answer, of course, is more highways and more super-highways; the bringing of more secondary roads and connecting roads into improvement schemes. All this is going to mean heavier expenditures, in view of which we must have at the earliest possible moment a clear-cut definition of how much of the bill the car owners shall in fairness bear."

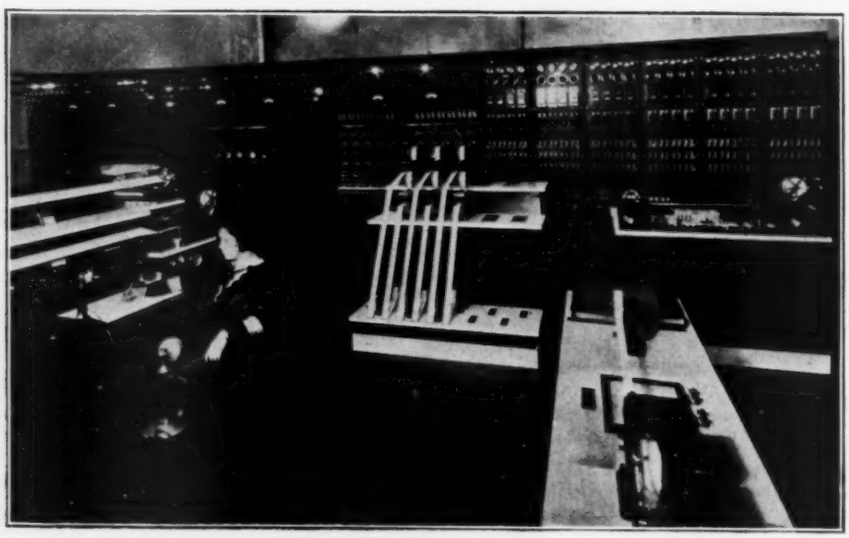
FORWARD STEPS

Reported by

Municipal Officials, Chamber of Commerce Executives, and Others

Central Fire-Alarm Office Has New Features

CANTON, OHIO.—An addition to the central fire-alarm office here has recently been completed, adding several new and unusual features and making it a very attractive layout. This office now utilizes the new box line board, which comes in four circuit sections and can conveniently be added to as the fire-alarm system grows in size. Another rather unusual feature consists of the recording sets shown in the center of the photograph, which are lined up in such a way as to permit the signals to be read easily by the operator from her position at the police desk. Space is provided on this pedestal for future growth. The recording set in the right foreground is an extra one that is used to record any alarms that might come in from the Timken Roller Bearings Co., which has a separate Gamewell system of its own.



FIRE-ALARM AND POLICE-SIGNAL EQUIPMENT, CANTON, OHIO

Another feature of the office is the fact that it houses the central-office equipment of both the fire-alarm and police-signaling systems. It is a semi-automatic office, but is operated manually most of the time. One woman operator is on duty at all times, both day and night, there being four shifts of six hours each for the operators. Her primary duty is to take care of fire-alarms, and her secondary duty is that of looking after the police signaling. Gamewell signal equipment is used for both the fire and the police department.

J. J. R.

A Combined Fire-Station and Community Building

BAXTER SPRINGS, KANS.—This rapidly growing city in the zinc mining district of southeastern Kansas recently completed a municipal building in which are housed all of the city departments, including fire and police. The building, which is situated in the business section of the city, is an imposing brick and concrete structure, trimmed with Bedford limestone. It is 45 by 80 feet in plan, and is two stories in height, with a basement under all except that portion of the building occupied by the fire department. The floors throughout the building are of reinforced concrete, and the roof is of composition laid on wood sheathing. The general contract was for $31,500, and a few extras and incidentals brought the total cost up to approximately $32,000.

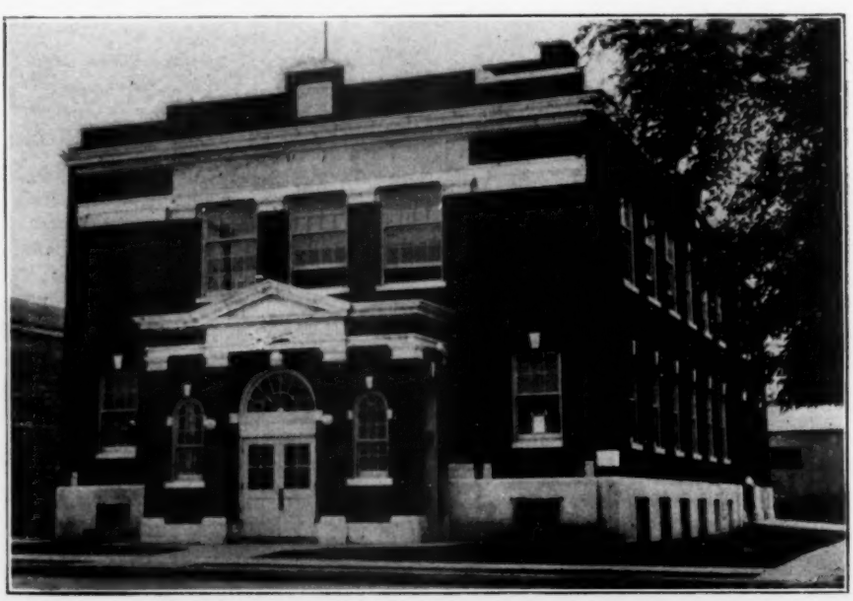
The jail, steam heating plant, fuel storage room, men's rest room, and water-works repair shop are located in the basement. The jail is at the front of the building, with a ward on each side of the hall, one for men and the other for women prisoners. Both wards have wash rooms and are equipped with comfortable beds. The walls, floor, and ceiling of each ward are of heavily reinforced concrete, twelve inches in thickness, and the doors and windows have substantial steel bars.

The water-works repair shop is a convenient place for testing and repairing water-meters, and other minor repairs are also made here. Reserve meters, supplies, repair parts, and small tools are stored here.

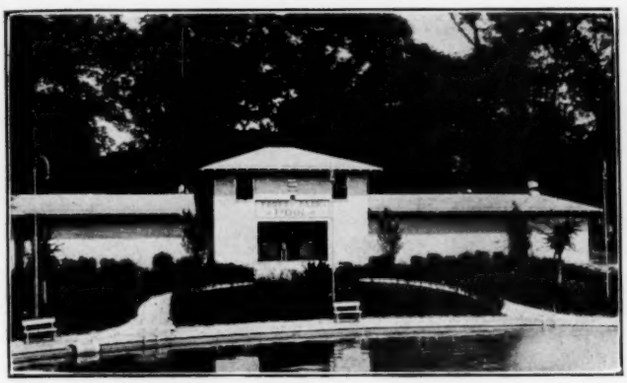
The offices of the city clerk, mayor, chief of police, and police judge are on the first floor. A large fire-proof vault is convenient to the city clerk's office, and all plans and important records are kept here. A room adjoining the mayor's office is fitted up for council meetings. A ladies' rest room is also on the first floor.

The fire apparatus room is built across the entire rear end of the building, with the floor on a level with the street. Two pieces of fire apparatus, as well as a water-works repair truck, are housed here. Part of the room is reserved for soda, acid, spare hose, other supplies, and a work bench where minor repairs are made. The exit for the fire apparatus is by means of two large folding doors which may be opened from the driver's seat. A hose-drying tower built against one wall of the chimney, and extending from the ground up through all the floors and roof, is a novel feature.

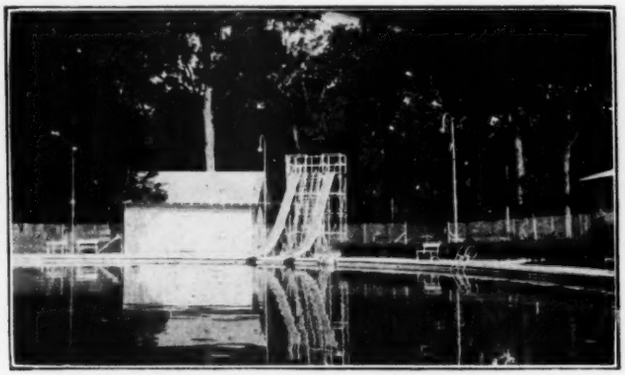
The portion of the second floor above the fire apparatus room is taken up by a club room for the firemen, and by an apartment for the one paid fireman and his family. The customary brass pole pro-



CITY HALL AND FIRE-STATION, BAXTER SPRINGS, KANS.



FOREST PARK POOL BATHHOUSE, OTTAWA, KANS.



FILTER HOUSE AND SLIDES, FOREST PARK POOL

vides a means of descent to the apparatus floor.

The city health nurse's office, as well as a court room and jury rooms, are also on the second floor. The two jury rooms, one for men and one for women, are both completely furnished, and each has a wash room. The court room may also be used as a small auditorium.

Smith and Van Pelt, 819-20 Frisco Building, Joplin, Mo., were architects for the building.

O. J. SWANDER.

A Big Program for a Little City

SAN ANGELO, TEX.—This little West Texas city of some 25,000 persons probably has one of the largest civic improvement programs of any city its size in the United States. The recent voting of $800,000 in bonds for public improvements was followed within a week's time by a vote of $294,000 for a new court house; these two elections following shortly after the city had voted $250,000 in bonds for a junior college and the county had voted $500,000 for the construction of hard-surfaced highways.

An outstanding item in the $800,000 bond issue is $355,000 as the city's part of a paving program to be spread over a period of five years at a cost of $1,420,000. The city's bonds will pay its one-fourth share, the property owners taking care of the remaining cost. The program will include the paving of 250 city blocks. The first contract, for paving of 35 blocks, has been let.

Another item in the big issue was $250,000 for the construction of a city hall and municipal auditorium. It is believed the old city hall property can be sold for enough to make the new structure a $300,000 building.

San Angelo property owners will have better fire protection as the result of the bond issue, as $75,000 was included in the issue for four district fire-stations, one to be located in each part of the city. This is expected to lower the insurance rate. Another item in the issue was $25,000 for a fire-alarm system; and, while not included in the bond issue, a new central fire-station is soon to be built in San Angelo.

The bond issue included $25,000 for a city incinerator, this being a part of the city's campaign to make San Angelo the cleanest city in West Texas.

The sewer system in the city will be expanded with $20,000 included in the bond issue for this purpose. Conversion of 6 per cent sewer extension refunding warrants into 5 per cent bonds will be done with the remaining $50,000 of the bond issue.

The five-year program is well worked out as to expenditures year by year. There will be $100,000 available the first year for construction of the city hall, and $150,000 the next, completing the work. Of the $355,000 for paving, $65,000 will be made available the first year for the city's one-fourth share. Within the year the first of four district fire-stations will be built, the fire-alarm system will be installed, an incinerator established, and extensions made to the city's sewer system.

MILLARD COPE.

Ottawa Engineer Operates Municipal Pool

OTTAWA, KANS.—Forest Park Pool, in Forest Park, Ottawa, was completed May 28, 1927, at a toal cost of $18,000. It was undertaken by the city authorities, who, after spending $6,000—all that was then available in the park funds for such purposes—found themselves up against the problem of getting enough money to complete the undertaking. They finally agreed to lease the pool to me and J. A. Lawrence for a period of ten years if we furnished the balance of the $18,000, which we did.

The pool was designed by City Engineer W. O. Myers and myself. It is cleaned by a vacuum cleaner process, being drained every two weeks. The filtration is of the gravity and drinking-water filter type, and sterilization is by the use of chlorine.

The average number of bathers per day during the season is 150. Charges are made at the rate of 25 cents for adults and 15 cents for children; with charges of 15 cents and 5 cents for suits and towels.

C. A. NOVAK,
Assistant Engineer.

School and Park Officials Unite in Fostering Love of Wild Life

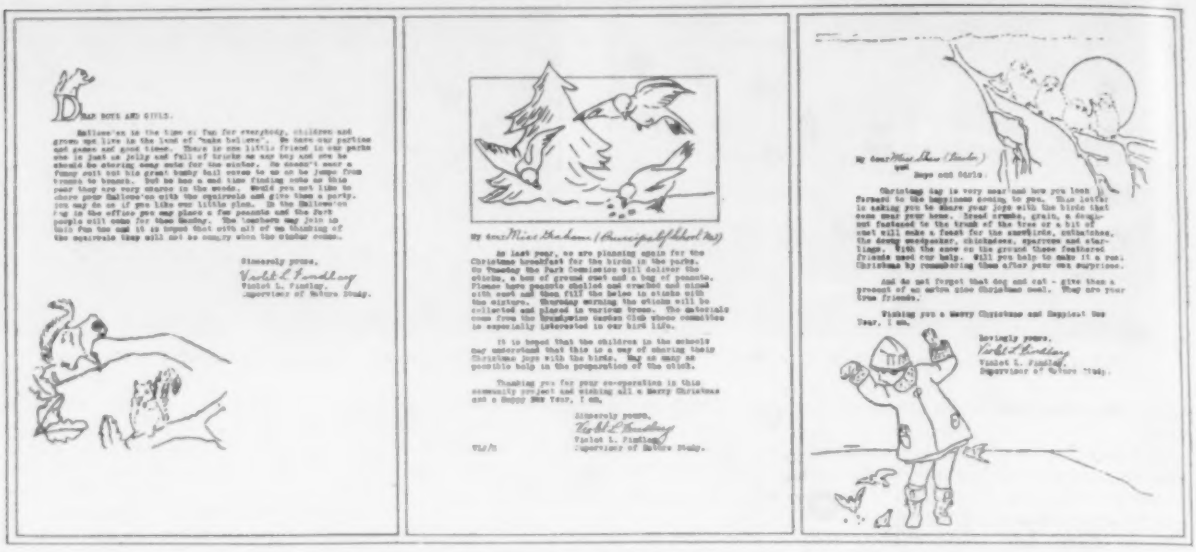
WILMINGTON, DEL.—Through the very heart of our residential district flows the historic Brandywine, the banks of which are lovely woodlands. Here is a public park and, as the future beauty of parks is in the hands of children, and as ownership almost always engenders protection, one of the Park Commissioners suggested placing in the parks bird houses made by children. The school supervisor of nature study was called into conference, and the plan laid for this work. Bird houses have been made under direction of the manual training department with suggestions as to measurement, type, and adaptability given as nature study work. The contests were the civic work of one of the garden clubs, which supplied funds for prizes, and some materials. Other materials, salvaged from the débris of the park itself, were contributed by the Park Board.

The Board of Building Commissioners extended the courtesies of the City Hall to the school people, and the exhibit was staged in the main corridor. The judges were prominent citizens who had made a special study of bird life..

Prizes were awarded at a public meeting attended by members of the Garden Club. Each child had the right to do as he pleased with his house. A number were sold to interested citizens, many were retained by the makers, while another group was selected to be placed in the parks. This selection leaned to the rustic type. The placing of these houses was the work of park guards.

At the very first contest one member of the Park Commissioners gave $50 to be placed in the safe in envelopes each

A SESSION ON TREE STUDY UNDER TUTELAGE OF A PARK GUARD



BY THE GIFT OF A CHARMED IMAGINATION, MISS FINDLAY IS ABLE TO CREATE A SPIRIT OF LOVE AND UNDERSTANDING FOR ANIMALS THROUGHOUT THE SCHOOL SYSTEM

Here are some of the means employed

with $2.50 in it. Twenty such envelopes waited, one for each pupil whose bird house acquired a lawful tenant. Can any one doubt the feeling of ownership that each child has for the parks, especially for the one where his bird house was placed?

At Christmas time in 1926, the question of feeding birds in the parks was talked of and another bit of civic work was accomplished. Feeding-sticks three feet in length were made of cleared branches about two inches in diameter. Holes, six in number, were bored with an auger and a one-inch bit, to a depth of one inch. The Brandywine Garden Club provided suet and peanuts for the sticks, and the children in the public schools stuffed the food in the holes. The finished sticks were taken by the Park Commissioner and fastened to trees in parks,—near the schools where possible,—so that bird visitors might be studied by the nature classes.

The fall of 1927 brought the problem of feeding the squirrels during the winter, as Nature's usual supply of their sort of food was very short. In connection with announcements of Hallowe'en festivities of the school children, a request for peanuts and other nuts was sent out by the supervisor. As a result of this, the schools gave to the Park Commissioners ten bushels of nuts for the squirrels. These were stored and are being distributed by park guards when the need for food is seen.

Christmas of 1927 saw the sticks prepared again, and so the work goes on year by year. Surely such work among the children of our public schools must bear fruit in the care of our wooded land, and for the children an appreciation, through ownership, of the natural beauty of our city.

VIOLET L. FINDLAY,
Supervisor of Nature Study.

A GROUP OF PRIZE WINNERS AND THEIR BIRD HOUSES—1927 EXHIBIT, WILMINGTON, DEL.

Factors Affecting Successful Surfacing of Playgrounds and Drives

HARRISBURG, PA.—Franklin J. Roth, President of the School Board, and other school authorities of Harrisburg, recently devoted some time to the problem of successfully surfaced playgrounds. It was decided that three main considerations should influence the selection of a surfacing material such as would prove satisfactory to those who used and those who paid for the grounds. These are application, cleanliness, and maintenance. A number of materials were recommended to meet some one or two of these requirements, but upon investigation by the School Board most of such products were found to be in the experimental stage, and the actual selection proved decidedly narrow. In view of the choice made and subsequent experience, we consider our basis of selection entirely satisfactory.

Under "Application" the expense both of the surfacing material and of its application on the proper base was considered. In addition, the amount of time required from the start of work until the playground was ready for use was essential in the figuring. First place under this factor was given to Kyrock, the material finally chosen, a product of the Kentucky Rock Asphalt Co. We found this product could be laid cold, utilizing our present base; it could be laid at minimum expense, without the cost of special equipment or asphalt experts, entailing only the preparation of the base, the hauling of the material to the job, raking to grade, and rolling. There was a noticeable advantage in the time element of surfacing with this product.

"Cleanliness" was considered partly because of our past experiences. This factor was brought into the calculations—not as applied to the material to be used, but in its relation to students and buildings. Under old conditions, the pupils who used the playgrounds could not avoid picking up mud, dust and dirt, and later this was tracked into the buildings. Thus expense for cleaning was greater to parents and schools alike.

"Maintenance" presented more difficulties than the other factors. A selection was determined by checking the past performances of various materials under actual service conditions.

It was decided to use the material chosen for the playgrounds for some of the school drives also. Two separate contracts were let—one for 14 school playgrounds and yards, amounting to 31,000 square yards, and the other for driveways, amounting to 3,000 square yards.

The surfacing in the yards and playgrounds so impressed school authorities and pupils that a contract has been awarded for surfacing the yards and playgrounds of eight additional schools with the same material. The grounds to be surfaced under this contract aggregate about 12,000 square yards.

We have utilized the old bases, in all cases grading them first. Three to four inches of good engine cinders were added and wetted down and then rolled until hard and firm. After allowing this to dry thoroughly, 1½ inches of loose surfacing material was spread and raked—then rolled with a 7-ton tandem roller. A thin seal coat of sifted material was then spread to fill any possible honeycombs or depressions—and this was then rolled with a 400-pound hand roller. Around trees, posts, etc., where it was not possible to work closely with a roller, the surface was hand-tamped, which was sufficient for proper bonding of the material. The largest area surfaced was at the Steele School, approximately 4,000 square yards. Pupils were allowed on the playgrounds as soon as the surface was rolled.

It is interesting to note that the application of this material proved so simple that later each school was supplied with a barrelful of the material to be used by the janitor for patching when the original surface should be disturbed for post-holes or any alterations which might necessitate cutting the surface.

The driveways of one school were constructed on a limestone macadam base. The old base was dressed up and brought to grade by adding additional stone. This was watered and rolled tight. Two and one-quarter inches of loose surfacing was spread and rolled with a 5-ton, 3-wheel roller. A thin seal coating was then spread and rolled after the first rolling.

Our school yards and playgrounds are now clean, smooth, resilient and wearproof. The material is slightly darker than ordinary asphalt, non-glaring and easy on the eyes under the sunlight, and it has a fine sandpaper-like surface that offers ideal traction for the feet in play and sports. The surface is dustless, that is, it does not scuff up under the feet in dry weather. It does not smut the clothes and is free from mud in rainy weather. As a consequence, our yards and buildings are much easier to keep clean, and maintenance of grounds and buildings is reduced to a minimum.

DANIEL H. BARR,
Superintendent of Buildings, Harrisburg School District.

THE SURFACING OF SCHOOL YARDS AND PLAYGROUNDS IN HARRISBURG, PA.
At the top is shown the driveway approach to the John Harris High School, with surfacing partly spread but not rolled. The other two pictures show the grounds of the Forney Grade School: the spreading of the wearing surface on the rolled cinder base; and the school children at play on the surface immediately after it was rolled

City Puts Out Fire That Has Burned Two Years

LOS ANGELES, CALIF.—One of the strangest fires in this country has just been extinguished here after two years of litigation. During this period the fire was gradually spreading through a large section of land known as the "peat beds." The underground fire smouldered day after day and created a menace to the surrounding residential district. Mothers cautioned their children to stay out of the "burning earth" region, while curious people from the city visited the area daily.

The municipal government notified the owners of the land to extinguish the fire on their property. But the owners maintained that the fire was an act of God and that they were not responsible for the conditions. Such communications were exchanged for nearly two years while the underground fires spread to six times their former area and the nearby residents increased their demands upon the property

THE GREAT DITCH DUG BY THE CITY OF LOS ANGELES FOR CARRYING STORM WATER TO THE BURNING PEAT BEDS

owners and city in like proportions.

Without waiting for further hearings in the case, the city of Los Angeles appropriated $14,000 for extinguishing the fire in the peat beds. A huge drain ditch was cut from a nearby storm drain and several pipe lines installed. They waited for the first big rain, and then all the storm water was diverted on to the peat-bed land. There was a great hissing and steaming from every burning section touched by the flood of water. Mud geysers shot upward ten or fifteen feet in height, clouds of low-hanging steam vapors rolled along the surface. Fire-hoses were attached to the pipe lines, and high-top-booted workers directed giant streams of water into the larger fissures. Gradually the seething earth quieted and the fire was out, thus establishing for the municipal fire squad a record of two years in extinguishing a fire.

WILLARD D. MORGAN.

Town Buys Electric Power from Large City and Serves Communities Between

MORTON, WASH.—This town is progressing with the construction of a transmission line from Morton to La Grande, Wash., a distance of 22½ miles, by way of the unincorporated towns of Mineral and Elbe, and with the distribution system within and outside the town of Morton. Power will be purchased from the La Grande plant of the city of Tacoma. The transmission line will be of Number 4 wire, three-phase, on 45-foot poles. The initial voltage will be 23,000, but the line will be built for 33,000 volts. In the construction of this pole line the route has been selected off the railroad and public highway rights-of-way, on account of interference with telegraph lines and, in the case of the highways, on account of the fact that between Morton and Elbe the State Highway Department has not at this date approved any one of the several surveyed routes. The uncertainty of the route and the certainty that the construction work, when in progress, would disturb the service on our lines, influenced the town officials.

There was an election held on June 25th, at which the voters of the town approved a $40,000 utility bond issue for the purpose of constructing a transmission line to La Grande by a shorter route, but the persistent and vigorous solicitation of the communities of Mineral and Elbe have persuaded the Morton authorities to pass through these towns and supply this insistent demand for lights.

The engineers, however, showed that it would require $60,000 to construct and complete the system, as decided upon, and an election was held in Morton on November 19th, at which the voters approved the proposition of replacing the former bond issue with a new one of $60,000 to cover the latest route selected.

The town of Morton is entirely surrounded by coal and mercury mines, all requiring electric power, which it is now impossible for the local privately-owned system to supply.

The Morton Electric Co., established some fourteen years ago, has long since been outgrown and the rate has been prohibitive, being 15 cents per kwh. to consumers. The load has long since exceeded the capacity of the local plant, and the indisposition of the company to keep up with the demand has precipitated this new movement.

The Morton water system, installed five years ago, financed by a utility bond issue, has proved a record-breaker as to quality and quantity of water and value to the whole district, and, besides, the department is now two years ahead of the bond issue redemption schedule. The town of Morton has no general bonded indebtedness, and is on a cash basis.

Several persons, including the writer, have been making a careful canvass of the district through which the proposed line will run, ascertaining, so far as possible, the volume of business likely to accrue to the system when completed. It has developed so far, with only two-thirds of the territory covered, that the income at our reduced rate will be double the expenses of the system, including both fixed and operating expenses. We expect that the completion of this canvass will reveal an assured income of about three times the expenses.

New enterprises, which were not existent when this project was started, about a year ago, have since developed and advanced to a remarkable extent. Opposition to the project is dwindling materially.

The town now sees its way clear to cut the current rates of electricity to about half what is charged by the local privately-owned system.

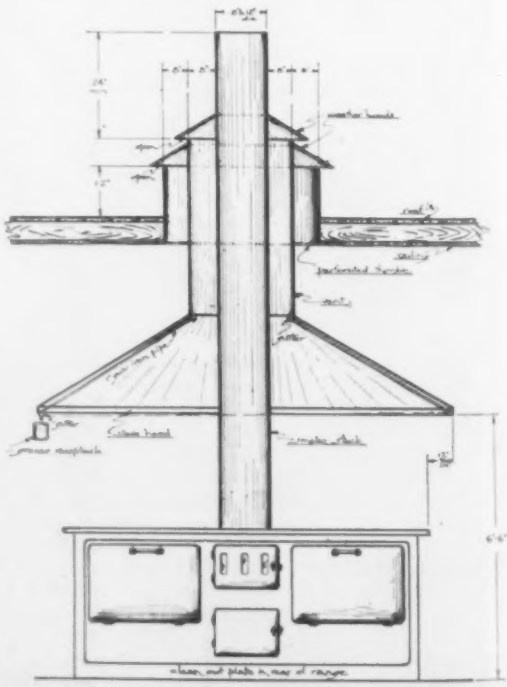
T. J. POLLEY,
Mayor.

Fire Hazard from Restaurant Vents Minimized

FRESNO, CALIF.—On the principle that all hoods and vents may burn out due to the immense amount of grease used in cooking at restaurants, Fresno is recommending installations that will work efficiently and also safely.

A few years ago the Fresno Fire Prevention Bureau was organized and put under the direction of the Commissioner of Public Safety and Welfare (the Mayor). It is composed of Fire Marshal W. R. Williams in charge with Deputy Fire Marshal L. A. Moore supervising the work of five inspectors.

One of the most hazardous conditions found existing in the city was the manner in which restaurant stacks and vents were installed and kept. Where a suction fan was used the grease was thrown upon the wall, roof or adjacent building. If a long



SAFE HOOD AND VENT DESIGN FOR RESTAURANT RANGES, RECOMMENDED BY CITY OF FRESNO, CALIF.

load of pipe was used the grease was left inside the vent pipe due to condensation. In one case a spark generated by the fan ignited the hot grease and the fire spread back to the hood and ignited the hood.

A plan was worked out on the principle that a vent placed around the smoke stack would carry the grease out better than a small vent or suction fan.

The cost of a properly installed hood and vent containing a suction fan in a one-story building was approximately $700.00. The same installation put straight through the roof cost approximately $300.00, a saving of $400.000.

The straight-through installation has proved itself more satisfactory, as to both draft and cleaning. It is not recommended where a building, or those adjacent, are over four stories high.

The hood is constructed of No. 22 or 24 U. S. gage galvanized iron, extends over the side of the range from 1 to 2 feet, and is 6 ft. 6 in. from the floor. The stack or chimney is No. 18 black iron and rises from the range straight through the ceiling and at least 4 feet above the roof. The vent is constructed of No. 24 galvanized iron and extends in a vertical position through the roof at least 2 feet. An 8-inch air space between the stack and vent has been found adequate to take care of the rising grease and also facilitate proper cleaning at regular periods, usually from 2 to 4 months. The braces holding the stack inside the vent are placed directly above each other to allow for the proper cleaning of the vent.

The grease is carried up by the heat around the chimney or stack, such of it as strikes the walls of the vent running down and being caught in a small gutter around the joining of the hood and vent, whence it is carried by a one-inch pipe to a gutter just inside the hood, which slopes slightly in one direction, allowing the grease to flow into a receptacle of some kind.

Weather hoods are placed around the chimney above the roof line and extend over and beyond the vent to keep out the rain. An 8-inch air space inclosed by No. 22 galvanized iron is constructed around the vent next to the wall.

The results of the above outlined hood and vent installations have been very satisfactory. Soot in the stacks and grease in the vents have caught fire in several cases due to careless firing, etc., yet in no place has the building caught fire where this type of construction is used.

A. E. SUNDERLAND, Mayor.

The 1928 Better Homes Campaign

THE week of April 22 to 28 of this year will be observed by over 4,000 communities of the United States, including Alaska and Hawaii, as Better Homes Week, a week in which the subject of home improvement will be especially stressed.

In each of these communities a local committee, the chairman of which is appointed by Better Homes in America, is now perfecting plans for various demonstrations at that time. Better Homes in America is the national organization at Washington, D. C., with Secretary Hoover as President, which sponsors an annual campaign to teach the principles of home improvement to the American people.

The local campaigns which culminate in Better Homes Week are varied in character, to suit the size and conditions of the individual community. In some parts of the country local committees report that they themselves have selected the designs for houses of from three to six rooms, to cost not more than $10,000, including lot, and that they themselves will build the houses and furnish them as an object lesson to their communities in achieving beauty and comfort with small expenditure. Committees in other communities report plans to borrow attractive houses recently completed and to show them to their communities. Still other committees plan to remodel and to refurnish old houses.

Such demonstrations of complete houses are more likely to take place in cities than in rural regions. It is more difficult to organize an extensive campaign in country sections. But the rural committees have a multitude of ideas on the subject of improving homes. Some of them are planning to exhibit an improved kitchen to the farm wives of the community or of the whole county. Of perhaps it may be a better living-room. Many committees will campaign to clean up yards and public places, making them generally more attractive. Home-garden contests are an interesting feature in many communities. In some cases the local chairmen write of plans to organize automobile tours, sometimes county-wide, of homes notably improved during the past year.

An interesting example of the sort of thing frequently done by local Better Homes committees in rural communities is the reconditioning in 1926 of a tumble-down house by the Better Homes committee of Mablevale, Ark. For years this house had been used as a storage barn for corn and hay. The Better Homes committee aroused the interest of the hundred-odd families living within a radius of five miles, and they joined in making the dilapidated shack into an attractively landscaped, charming cottage.

From present indications, Better Homes Week this year will witness many more of these demonstrations, which are gradually raising the standards of American homes. Assistance for local committees is available from the Washington headquarters, 1653 Pennsylvania Avenue.

CONSTANT SOUTHWORTH,
Assistant Director Better Homes in America.

THE OLD SHACK AT MABELVALE, ARK., WHICH THE BETTER HOMES COMMITTEE SELECTED FOR RECONDITIONING

WHAT THE COMMITTEE DID WITH THE MABELVALE SHACK

New York Selects Its First Airport Site

BROOKLYN, N. Y.—The first site to be developed as an airport by the city of New York, as determined by unanimous vote of the Board of Estimate and Apportionment on February 2, is the so-called Barren Island site, which is one of the alternative sites recommended by the Fact-Finding Committee, New York Metropolitan Airports, and shown as No. 39 on the Committee's map reproduced in THE AMERICAN CITY for January, at page 119. It consists of an area of about 800 acres, owned by the city, situated in the southeastern corner of the borough of Brooklyn between Barren Island, Flatbush Avenue, Mill Basin and Jamaica Bay. The site was once marsh land, about 300 acres of which have been filled to grade with sand from channel dredging in Jamaica Bay; the rest is partially filled. Planes have landed and taken off from it. Flatbush Avenue, which it adjoins, is a main traffic artery leading to the heart of Brooklyn and of Manhattan. The airport site is 15 minutes by motor-bus from an outer subway terminus at Flatbush and Nostrand Avenues. At the meeting when this site was decided upon, $500,000 was set aside to carry forward rapidly the work of preparing the area for its new use. A plan for building six piers on the waterfront in this section has previously been approved by the Board of Estimate and Apportionment, and a channel 30 feet deep and 1,000 feet wide has been dredged in Jamaica Bay to accommodate the steamships that will use these piers. Arrangements to extend the Long Island Railroad to Barren Island are being worked out. There will be city land available for appropriate industries, adjoining the airport. The United States Naval Air Station is situated across the entrance channel of Jamaica Bay from Barren Island, upon the Rockaway Peninsula.

WALTER G. PETERKIN,
Chairman, Airport Committee, Civic Council of Brooklyn.

More Small Towns Need Safe Milk Supplies

THE American Child Health Association has concerned itself actively since 1923 in behalf of a clean and safe milk supply for every baby, child, and adult in the country. But according to conclusions arrived at by officials of that organization from the survey of conditions in small towns, there remains much yet to be done not only in the matter of pasteurizing milk supplies but in milk sanitation in general.

An outline of the survey, as presented by Samuel J. Crumbine, M. D., General Executive, and Dorothy F. Holland, Ph.D., Staff Associate of the Association, in the November, 1927, issue of the *Child Health Bulletin* shows, by tables, the status of pasteurization in cities under 25,000 population. It discusses, also, bacteriological analyses and states that "milk supplies were, on the whole, dirty according to physical standards. Only 19 of the 117 towns had 50 per cent or more of their supplies 'clean' or 'fairly clean,'" while "the danger of infection to milk consumers by tuberculous cattle is a real one in the towns and cities surveyed."

The conclusions reached are, in part, that:

"If we may use milk supply control as an indication of sanitary development, health department practice of the small town is still in its infancy. Its milk supply is little better in sanitary quality than it would have been if the process of pasteurization had never been discovered. The initial high bacterial count of the milk is increased by failure to ice the supply, and protection from danger of infection by man and cattle is not prevented by pasteurization. . . . The problem of the small town is to awaken its citizens to the need for the production of clean milk rendered safe by pasteurization. This requires the passage and enforcement of a proper ordinance for the control of milk."

Fire Prevention Efforts and Results

THE 1927 fire loss for Kansas City, Mo., shows a further reduction of $395,958 over 1926, indicating a continued improvement since the National Fire Protection Association inaugurated its efforts there with the cooperation of the engineers of the Missouri Inspection Bureau in 1925. The per capita loss figures are:

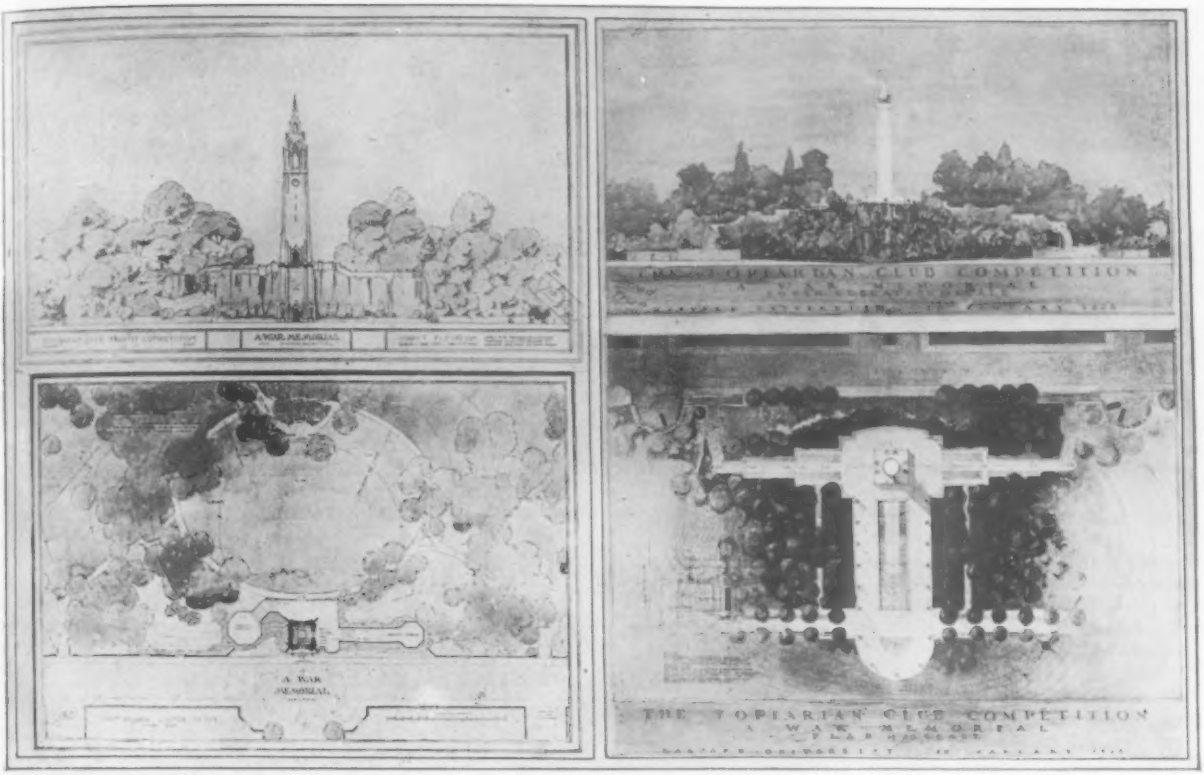
Year	Per Capita Loss
1921	$7.93
1922	9.17
1923	7.18
1924	6.95
1925	8.95
1926	4.13
1927	3.17

The 1927 loss approximates the average for other cities of the country for the first time in over eight years.

Try to See America First!

WELL, WE'RE OFF
SA-A-Y! WHO TAUGHT YOU HOW TO DRIVE? DON'T YA KNOW NUFF TA GO ROUND ME ON A LEFT TURN?
SNOOP CITY
I DON'T CARE WHAT THEY MADE YOU DO IN SNOOP CITY!! IT'LL COST YOU MONEY IF YA MAKE A LEFT TURN AROUND ME!
RASHBURGH
HEY, RUBE! WHO'S DEAD? SPEED UP THAT HEARSE - YER BLOCKIN' TRAFFIC
SNAFFLETOWN
HERE'S WHERE THAT GUY PAYS FOR HIS BREEZE. BUSINESS IS GETTIN' BETTER.
SPLINEVILLE
REVERSE ON BLACK
EAST ON SALMON
STOP ON CRIMSON
GO ON LIME
NORTH ORTHDALE
AHEAD ON GREEN
WEST ON PINK
BEGIN ON LEMON
LOOK INTELLIGENT ON LAVENDER
KNUCKLE CITY
WHY SEE AMERICA'S JAILS? I'M THROUGH!

For this graphic portrayal of the problems of the motorist who tries to "See America First" under present conditions of chaotic and conflicting traffic regulations, The American City is indebted to "The Mack Bulldog," in a recent issue of which the cartoon appeared



Two Prize-Winning War Memorial Designs

"A NEW ENGLAND city of 200,000 inhabitants has raised a large sum of money for a war memorial. It has been decided that this shall be commemorative rather than useful, and that it shall be located in the southeastern portion of the park, which (portion) shall be appropriately developed and treated as a dignified setting for the memorial. It is generally agreed that the memorial shall be a dignified architectural or sculptural structure and that it shall be related, as far as possible, both to the city and to the park."

Here is a situation typical of those which have been faced by a large class of municipal officials since the movement toward the erection of World War memorials began and since the general renascence of interest in civic art projects. It is supposititious, having been created as the problem in the recently held seventh annual competition for the Topiarian Trophy Cup, which was open to all students of the Harvard University School of Landscape Architecture. The standing of this institution (one of the graduate schools of the University) and the fact that the 41 contestants included many third-year men, as well as first and second-year men, no less than the significance of the subject, give the prize-winning designs a right to consideration beyond that ordinarily accorded to the work of students.

B. S. Pray was the recipient of the Cup (to have his name added to the list of former winners inscribed upon it, and to be its holder until the next competition). Mr. Pray is a graduate of Harvard, class of 1925, a second-year man, and the son of Prof. James Sturgis Pray, Chairman of the School of Landscape Architecture. Robert S. Stryker (B. S., University of California, first-year man) was second prize-winner. A third prize and two honorable mention awards were given Ralph L. Reaser (Ohio State University); Francis J. Comier (Mass. Agricultural College), and Robert O. Thompson (University of California), respectively.

Interest was added to the competition by the topography, and particularly by the requirement for placing the memorial on a cliff. The winning drawing, as shown in the illustration, is a campanile, or belltower, and is distinguished by Mr. Pray's bold conception of carrying the feeling of the tower to the base of the cliff. The second prize design is a marble shaft in the top of which burns a perpetual flame supposed to have been lighted on Armitice Day.

The Jury included, in addition to members of the teaching staff, Robert W. Beal, President, and Leon H. Zach, Secretary, of the Boston Chapter, American Society of Landscape Architects.

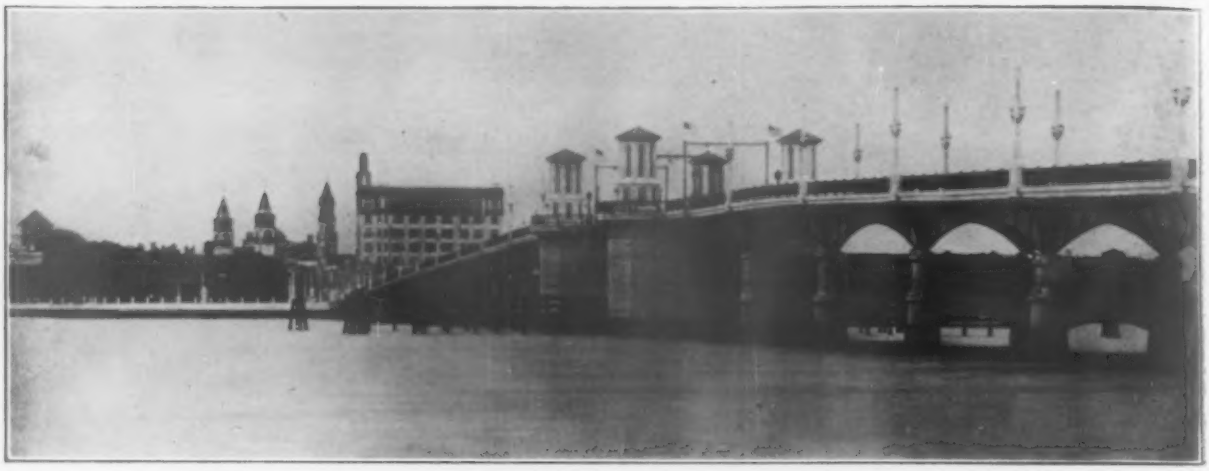
An Interesting Bridge Structure

THE long stream of pleasure-seekers leaving the snows of the North this winter for the sunshine, golf, and surf of Palm Beach, Miami, and other east Florida playgrounds, have been enjoying a new path over a much more beautiful route than heretofore. For the first time, motorists may ride along the seashore or Indian River practically the entire length of Florida. This has been made possible by the completion of the Seashore Drive from St. Augustine to Daytona Beach in conjunction with the opening of the great steel-and-concrete bridge over Matanzas River, at St. Augustine.

The bridge was built by the Virginia Bridge and Iron Co. and was erected at a cost of $1,008,735. It is 1,550 feet long and has an 85-foot draw in its center, the draw being of the two-leaf bascule type. The electrical work was done by the Richardson-Wayland Electric Corporation. The bascule is operated by General Electric motors and control. Solenoid brakes are used. A magnetic control panel automatically operates the signal-light board, the gates, warning bells and lights on the roadway, as well as the navigation lights on the bascule.

The Florida Power and Light Co. operates a trolley system over the bridge, thereby furnishing ready transportation between Menendez Park (the plaza about which the St. Augustine business section is built) and the beach. A magnetic interlock kills the section of trolley over the bascule, should the signal-board lights indicate any position other than fully closed.

White-way units make the bridge a well-illuminated thoroughfare by night, as well as an ornamentally lighted structure. These units are General Electric Form 18 lanterns, with a bracket which is mounted on the concrete poles carrying the trolley wires. Two lanterns were used on each pole and a parallel arrangement of stand-



STEEL AND CONCRETE BRIDGE ON THE MATANZAS RIVER AT ST. AUGUSTINE, FLA.

ards was used, thus giving excellent illumination. The whole lighting scheme included 128 lanterns, while on the draw itself four red, four green and two red and green signal lights were installed. Two small floodlights are used for floodlighting the area where the toll officer is located.

W. P. LYMAN.

New Street Lighting in Oakland, Calif.

A special design, typifying Oakland, is used in the 353 two-light cast iron standards recently put into use in the business district of that important California city. Included in the ornamentation are oak leaves, acorns and poppies, which are used in the City Hall decorations and are emblematic of the city and state. There are two "Washington" type Novalux fixtures, with 15,000-lumen series lamps, on each standard, with two transformers in the base of the latter. The equipment is General Electric. The accompanying photographs show the standard with fixtures, and also the effect of the lighting from a bird's-eye view

A Suggestion for Street Traffic Safety from Railroad Experience

URGING that officials responsible for traffic control on streets and highways get after not only the reckless drivers, but also the drivers who do not realize the dangers involved in operating an automobile, Thomas H. Carrow, Superintendent of Safety of the Pennsylvania Railroad Company, suggested at the 1928 Purdue University Road School the adoption of methods similar to those which have helped the railroads to secure safe operation:

"Many of the large railroads of the country have operated several successive years without a passenger being killed in a train accident. It has been more than a year and one-half since a passenger was killed in a train accident on the Pennsylvania Railroad, during which time about two million trains were operated and about two hundred million passengers were carried.

"What is the explanation of this comparative immunity from death while traveling on passenger trains? Simply this: The railroads have adopted a comprehensive set of operating rules; the employees are properly trained and examined on these rules, and constant supervision and checks are provided to see that the rules are observed. On every division of every railroad there is at least one man assigned to make tests and observations to detect violations of rules and regulations in addition to the checks and observations made by supervisory officers.

"For example, in one of the three regions of the Pennsylvania Railroad in one month 184,911 tests and observations were made, which showed a 99.89 per cent perfect performance, and for every one of the few violations of rules or regulations detected the employees found guilty were held just as responsible as if an accident had resulted, and penalties fitting the violations were imposed.

"The methods employed to secure safe operation by the railroads in modified form are the only methods that will secure safety on the highways, and that is a system of checking on the observance of the rules of the road and the imposition of appropriate penalties for violations.

Recommendation

"It is therefore recommended that the Road School take such action as may be necessary to secure a state-wide check of automobile driving on all of the roads of the state of Indiana for a period of, say, three days, three times a year, to detect all forms of careless or reckless driving and violations of law or rules of the road. At least 500 checkers, either officers of the law or other persons selected for the purpose, should be assigned to do the checking.

"It is also recommended that the results of these checks be tabulated on forms to be provided for the purpose, summarized and distributed throughout the commonwealth.

"In no other way will the people of Indiana or any other state become apprised of the extent of the danger of driving on the highways. In no other way will public officials become impressed with the necessity for taking remedial action."

A Swedish Suggestion for Pedestrian Safety at Street Intersections

Can the Amber Period Be Eliminated in Traffic Regulation?

To the Editor of THE AMERICAN CITY:

I have with great interest read the article "The Amber Period—Help or Hindrance to Safety?" in THE AMERICAN CITY, page 379, September, 1927.

The report from the Committee on Electric Traffic Signals at Intersections seems to indicate that the question of using "the amber period" in the traffic regulation has not yet been satisfactorily solved in the United States of America. Seeing that Europe, as well as the other continents, likes to follow the American lead in this field, the consequence has been that also here conditions are somewhat unclear.

A proposition which eliminates the amber light, and, in keeping the green and red only, seems to solve the problem of giving the usual "stop" and "go" signal, as well as the indication "Signal is about to Change" and also a special signal to the pedestrians, therefore, ought to be of interest. This suggestion follows:

(*a*) *Signals for Vehicular Traffic.*

Four bracket (or post) lanterns would be used, one placed at each far corner of the intersection; each lantern to have two lights and lenses (red and green).

The switch arrangement would be provided with a "*telegraph key*," by means of which flash signals could be given immediately before each change of signals, and thus convey to the vehicular traffic a "telegraphic message": Be prepared to start (or stop); signal is about to change.

By such arrangement there is no longer any need for yellow light to indicate that signal is about to change.

(*b*) *Signals for Pedestrians.*

Usually the pedestrians have the right to walk with the green vehicular signal. In view of the risk on account of vehicles taking right or left turns, this signal, however, does not offer satisfactory safety to the pedestrians and especially to elderly persons. At intersections with intensive traffic it is, at all events, necessary to arrange for *special signals* for the pedestrians.

The signal lanterns, for the pedestrians, ought not to be placed together with the lanterns for the vehicular signals, partly for the reason that such signals are not so conspicuous to the pedestrians (pedestrians are not always going on the right sidewalk) and partly because the vehicular signals and the pedestrian signals easily can be mixed up and misunderstood.

It is therefore suggested that *special signal units* should be arranged for the pedestrians, constructed and placed about as shown on sketches Nos. 1 and 2. The lanterns (which ought not to be placed higher than about 2.5 meters (about 8 feet) above the ground) are to be provided with red and green lamps. To the green lamp a bell is coupled in. Behind and above the lamps there is a screening arrangement (or shade-hood), rendering the lamps invisible to the row of vehicles, and at the same time giving good visibility to the pedestrians on sidewalk. (Of course, the lan-

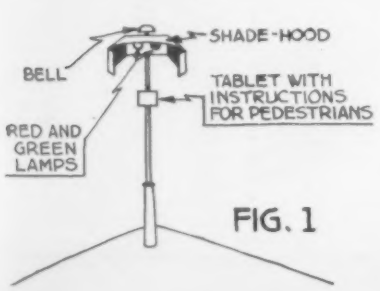


FIG. 1

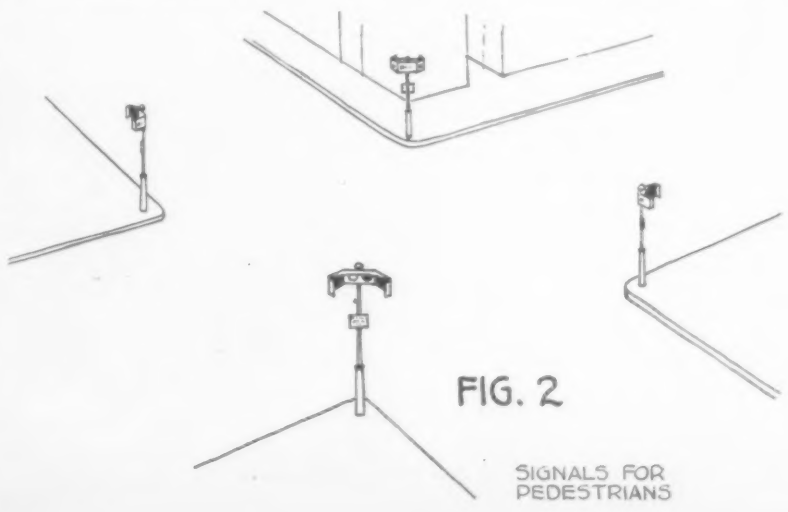


FIG. 2

SIGNALS FOR PEDESTRIANS

tern for the pedestrian signals can also be placed on the same post as the lanterns for the vehicular signals if desired.)

The red lamp in the pedestrian signals ought to be kept burning all the time during vehicular movement. (In spite of that, pedestrians who want to would be allowed to walk with the green vehicular signal.)

When *a pedestrian signal* is to be given, all vehicular signals are put at red. As soon as the intersection is free from vehicles, the green lamps in the pedestrian signals are lit and the bells are ringing.

When (after about 20 seconds) the pedestrian signal ceases, its green lamps are turned out and bells stop sounding (the red lamps are being lit). As soon as the intersection is free from pedestrians, the signaling to the vehicular traffic is carried on as usual.

As far as I know, the system outlined above has not yet been used or tried in practice.

I should be very grateful for any expression of opinion from American traffic experts as to what they think of the above suggested system.

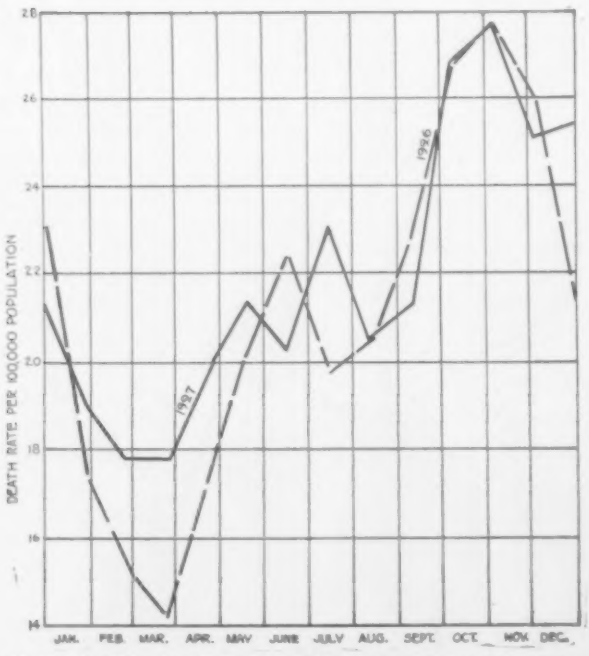
HUGO CARLIN

Parkvägen Lidingö, 2. Stockholm, Sweden,
January 27, 1928.

Automobile Deaths in 76 Large Cities

A Comparison of Fatalities from Automobile Accidents Reported for the 52 Weeks Ending December 31, 1927, with Those for the Corresponding Period of 1926

THE Department of Commerce announced on January 19, 1928, that automobile accidents were responsible, in 76 large cities of the United States, for 7,016 deaths during the 52 weeks ending December 31, 1927, in comparison with 6,586 deaths for the 52 weeks ending January 1, 1927. These figures indicate a death-rate of 22.0 per 100,000 population for the later period, as against the 1926 rate of 21.0, or an increase of 5 per cent in the rate in a single year. The figures in detail follow:



MONTHLY VARIATIONS IN DEATH-RATES FROM AUTOMOBILE ACCIDENTS, COMPUTED ON AN ANNUAL BASIS

Death-rates from automobile accidents based on deaths reported from 76 large cities for four-week periods: 1926 and 1927. The estimated midyear population of these cities for 1926 was 31,398,816, and for 1927, 31,961,735

NUMBER OF DEATHS, JAN. 3, 1926, TO DEC. 31, 1927, FROM AUTOMOBILE ACCIDENTS

City	Deaths from Automobile Accidents				Death-Rate from Automobile Accidents per 100,000 Population			
	52 Weeks Ending				52 Weeks Ending			
	Dec. 31, 1927		Jan. 1, 1927		Dec. 31, 1927		Jan. 1, 1927	
	Total deaths	Deaths due to accidents in city	Total deaths	Deaths due to accidents in city	For total deaths	For deaths due to accidents in city	For total deaths	For deaths due to accidents in city
Total (76 cities)	7,016	*	6,586	*	22.0	*	21.0	*
Akron	70	45	54	*	a	a	a	*
Albany	34	17	40	22	28.5	14.3	33.8	18.6
Atlanta	63	52	67	48	25.4	20.9	27.5	19.7
Baltimore	160	131	176	134	19.6	16.0	21.9	16.6
Birmingham	55	33	52	31	25.4	15.2	24.8	14.8
Boston	133	112	148	130	16.8	14.2	18.9	16.6
Bridgeport	24	19	28	19	a	a	a	a
Buffalo	126	107	139	*	23.0	19.5	25.6	*
Cambridge	25	*	18	*	20.2	*	14.8	*
Camden	64	22	53	22	48.2	16.6	40.6	16.9
Canton	44	38	32	*	38.9	33.6	29.2	*
Chicago	760	748	670	658	24.6	24.2	22.0	21.6
Cincinnati	130	*	124	*	31.6	*	30.3	*
Cleveland	243	224	257	*	25.1	23.1	26.8	*
Columbus	71	63	68	*	24.4	21.7	23.9	*
Dallas	46	34	54	42	21.8	16.1	26.7	20.8
Dayton	32	*	45	*	17.8	*	25.6	*
Denver	57	43	48	36	19.7	14.9	16.9	12.6
Des Moines	24	22	23	*	16.2	14.8	15.8	*
Detroit	386	382	355	*	29.0	28.7	27.6	*
Duluth	16	13	27	24	14.0	11.4	24.0	21.4
El Paso	28	21	19	12	24.7	18.6	17.4	11.0
Erie	37	35	40	*	a	a	a	*
Fall River	12	10	19	12	9.1	7.6	14.5	9.2
Flint	41	*	32	*	28.8	*	23.5	*
Fort Worth	28	27	25	22	17.2	16.5	15.7	13.9
Grand Rapids	34	22	31	12	21.1	13.6	19.9	7.7
Houston	46	42	34	32	a	a	a	a
Indianapolis	68	46	86	78	18.2	12.3	23.5	21.3
Jersey City	60	58	41	35	18.7	18.1	12.9	11.0
Kansas City, Kans.	19	9	4	1	16.2	7.7	3.4	0.9
Kansas City, Mo.	78	63	83	72	20.4	16.5	22.2	19.2
Los Angeles	301	276	226	214	a	a	a	a
Lowell	15	11	22	*	13.6	10.0	20.0	*
Lynn	13	12	12	12	12.4	11.5	11.6	11.6
Memphis	61	22	43	*	34.2	17.9	24.4	*
Milwaukee	119	108	94	*	22.2	20.2	18.2	*
Minneapolis	62	50	68	49	13.9	11.2	15.7	11.3
Nashville	45	27	39	20	32.7	19.6	28.5	14.6
New Bedford	12	9	8	*	10.1	7.5	6.7	*
New Haven	49	21	46	27	26.6	11.4	25.4	14.9
New Orleans	95	70	89	*	22.4	16.5	21.3	*
New York	1,084	1,081	1,059	1,054	18.2	18.2	17.9	17.8
Newark, N. J.	116	108	95	*	25.6	23.8	20.7	*
Oakland	54	44	55	51	20.3	16.5	21.2	19.6
Oklahoma City	21	21	27	*	a	a	a	*
Omaha	53	39	28	*	24.2	17.8	13.0	*
Paterson	52	31	25	12	36.3	21.6	17.6	8.4
Philadelphia	321	321	337	*	15.8	15.8	16.8	*
Pittsburgh	214	163	161	*	32.2	24.6	25.3	*
Portland, Ore	51	39	39	*	a	a	a	*
Providence	59	33	63	*	21.1	11.8	23.0	*
Richmond	43	28	39	20	22.5	14.6	20.7	10.6
Rochester	62	47	66	52	19.2	14.5	20.6	16.6
St. Louis	149	137	183	165	17.8	16.4	22.1	19.9
St. Paul	50	43	41	*	20.0	17.2	16.6	*
Salt Lake City	26	25	31	*	19.2	18.5	23.3	*
San Antonio	44	33	40	*	20.9	15.7	19.6	*
San Diego	37	26	47	37	32.2	22.6	42.8	33.7
San Francisco	126	122	121	112	21.9	21.2	21.4	19.8
Schenectady	12	8	23	*	12.9	8.6	24.8	*
Seattle	79	68	66	61	21.1	18.2	18.0	16.7
Somerville	10	9	14	*	9.9	8.9	14.0	*
Spokane	20	16	27	*	18.4	14.7	24.8	*
Springfield, Mass.	25	14	25	23	17.0	9.5	24.2	15.9
Syracuse	39	26	43	31	19.9	13.2	23.3	16.8
Tacoma	30	22	20	*	28.1	20.6	19.0	*
Toledo	108	81	74	*	35.5	26.6	25.1	*
Trenton	43	24	34	15	31.5	17.6	25.4	11.2
Utica	17	9	19	*	16.5	8.7	18.6	*
Washington, D. C.	107	78	98	74	19.9	14.5	18.6	14.1
Waterbury	13	13	15	*	a	a	a	*
Wilmington, Del.	40	33	28	*	31.7	26.2	22.6	*
Worcester	48	30	31	*	24.6	15.4	16.1	*
Yonkers	22	21	20	*	18.6	17.7	17.2	*
Youngstown	55	53	43	*	32.6	31.4	26.2	*

*Not reported. a Mortality rates are omitted, pending the establishment of more satisfactory estimates of population.

Traffic Count by Boy Scouts Under Auspices of Engineering Society

By LEON R. BROWN

CHAIRMAN OF THE TRAFFIC COMMITTEE OF THE ROCHESTER ENGINEERING SOCIETY

PUBLICATION last month in THE AMERICAN CITY of an article, "How Many Shoppers Park Autos in Streets?" has brought the suggestion that many readers would be interested to know just how the Traffic Committee of the Rochester Engineering Society and the Boy Scouts worked together in conducting the traffic count on which the article was based.

For several years the Engineering Society has taken an active part in assisting to solve Rochester's traffic problems. The engineers on the committee volunteered their services for the traffic count and secured the aid of the Boy Scout organization in Rochester through its executive, Arthur McKinney.

Forms were drawn up on which to record the data which they wished to secure. These forms, together with complete instruction, were mimeographed and turned over to the Boy Scout organization, which did the work without compensation as a matter of patriotic service. Thus the complete survey was made at practically no cost at all.

The traffic count was arranged as follows: For a twelve-hour period, from 7:00 A. M., to 7:00 P. M., a complete record was kept of all vehicles entering and leaving the downtown business district in Rochester. To do this, the Scouts were posted on each side of the thirty different streets leading into the downtown section. The vehicles were classified as to passenger automobiles, commercial automobiles, taxicabs, busses, street cars, and miscellaneous vehicles, which included horse-drawn vehicles, etc. The count was kept in half-hour periods and included the number of persons riding in each vehicle. Thus much information was secured by this one count in a very short period of time.

Figure 1 shows the form used by the Boy Scouts in recording the vehicles and passengers. The directions given to the Boy Scouts, as reproduced below, explain the use of this form.

It will be seen that by making only one figure for each vehicle in its proper place a Scout could record all the information required, as type of vehicle, number of passengers, location, time of day, etc. The Scouts worked in shifts of three hours each and were constantly under the supervision of Scout Masters and engineers of the Traffic Committee, who went from one boy to another to check up their work, see that the reliefs were properly made and that the data collected were accurate. All those who watched the Boy Scouts were enthusiastic with praise of the painstaking, accurate and thorough work which they did. The committee was of the opinion that the boys did as well as college students could have done.

In making a check of street cars and the number of passengers they carried, additional Scouts were used, each of whom checked street-car traffic at one point in one direction only. This work was checked by engineers from the Railway Commissioner's and the Railway Company's offices, who declared that the boys counted and estimated the passengers on street cars as accurately as it would be possible for anyone to do. Figure 2 shows the form used in recording street-car traffic. On the original there was an explanatory note to the scorer: "Put the number in each space representing the number of passengers in each street car. Use a space for each car, so that the total number of spaces will indicate the total number of cars passing you."

In addition to the traffic count, a count was also made of all automobiles parked in the downtown district at 10:00 A. M. of the same day. Nearly 100 Boy Scouts were used for this purpose, each of whom was assigned to count automobiles parked on one side of a street for a short distance which could be covered very quickly. The form of Figure 3 was used for this purpose. This form classifies parking in the various zones, including the illegal parking. The boys covered the ground again one hour later, checking on their list the license numbers of the cars which still remained where they were first found. The purpose of the parking check was to see how many cars were parked in the downtown business district and to what extent the parking laws were being violated.

The Boy Scout organization handled the entire traffic count by assigning to each Scout Troop the responsibility for the count at a particular location. The Scout Masters of the various troops selected the boys and arranged for the reliefs and also saw that the reports were turned in at the Scout headquarters at the completion of the count at 7:00 P. M.

All the forms for the traffic count were on 8½ x 11 paper, the required number of sheets being secured to a stiff cardboard on the back of which had been mimeographed a map of the downtown district. The location to which each boy was assigned was shown in red upon the map given to the boy. One pad of blank forms was used by the four boys who relayed each other for the twelve hours, each boy turning the pad of forms over to his successor, the last boy turning it over to the Scout Master or someone assigned to take it to the headquarters. In this way the forms were kept together and none were lost.

The whole survey went off like clockwork, with practically no hitches at all that affected the results of the count. The tabulation of the results was made by the members of the Traffic Committee after the Boy Scouts had added up the totals on the various sheets.

BOY SCOUTS ENGAGED IN MAKING A TRAFFIC COUNT IN ROCHESTER, N. Y.
Many of the Scouts brought their chairs or camp-stools with them and had quite a comfortable time during their three-hour shifts

DIRECTIONS TO BOY SCOUTS FOR MAKING TRAFFIC COUNT

Equipment

1. Each Scout should be supplied with a watch, at least two sharpened pencils, a jackknife, and an eraser.

Time

2. Report at posts a few minutes before 7:00 A. M., 10:00 A. M., 1:00 P. M., or 4:00 P. M., as the case may be. (Regardless of weather April 19.)

Left:—Coldwell Model "L" Motor Lawn Mower abd Roller. One man with Model "L" can mow and roll 10 acres a day, on one gallon of gasoline.

They *Know* What They Buy

Expending public moneys is a responsible undertaking. That is why conscientious officials in cities and towns throughout the United States invariably specify Coldwell Lawn Mowers. The dependability and long life of these machines are traditional.

LITERATURE ON REQUEST

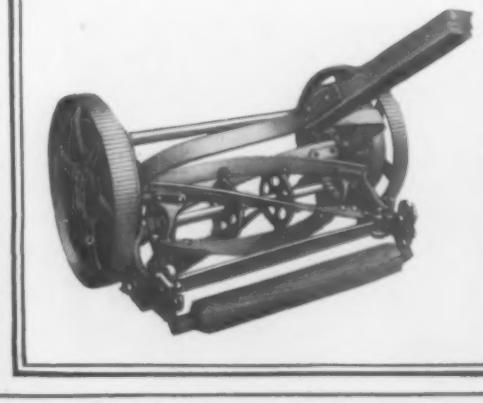
HAND — HORSE

COLDWELL

GASOLINE — ELECTRIC

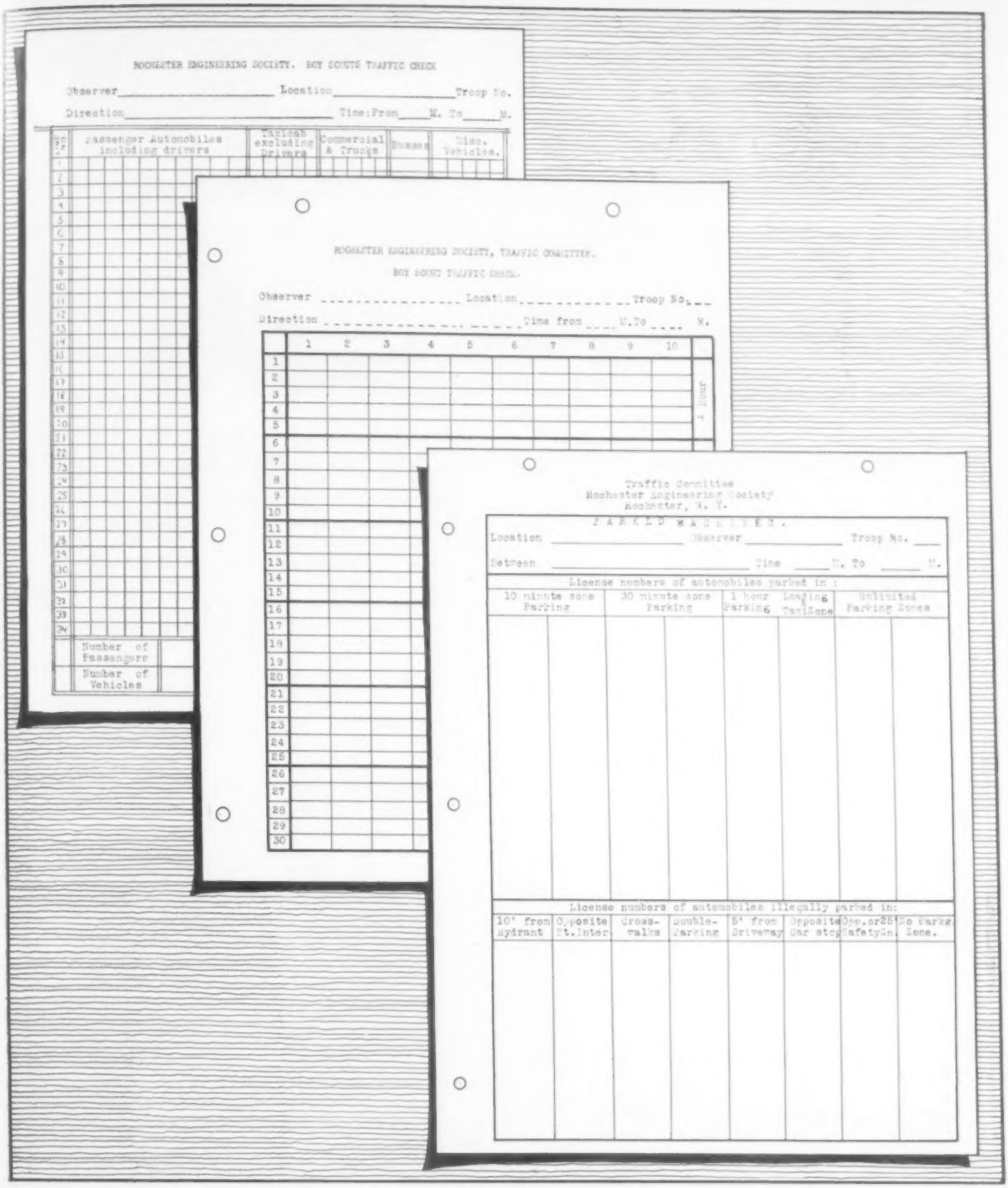
DEPENDABLE LAWN MOWERS

COLDWELL LAWN MOWER COMPANY, NEWBURGH, N. Y., U. S. A.



Coldwell Dependable Hand Mowers

At left: Imperial Roller Bearing. A famous Coldwell Mower greatly improved. New features! Now the most up-to-date hand mower on the market, bar none!



FORMS USED BY THE ROCHESTER BOY SCOUTS IN RECORDING THE TRAFFIC COUNT

Duration

3. Remain at your posts for three hours or until relieved by your successor. Then remain ten minutes longer to thoroughly instruct your successor in his duties. If for any reason your relief does not show up, one of the Scouts should call up headquarters, Main 824, and relief will be sent. Survey closes at 7.00 P. M.

Directions

4. Take a new sheet each half-hour.

5. Be sure that each sheet is carefully marked with the location, your name, the direction of traffic and the time interval during which the count on that sheet was made.

6. Stand at the curb, never in the street.

7. The idea is to record each vehicle and the number of passengers which pass your assigned point while you are on duty. As a vehicle passes, record the number of passengers in the proper column. Each number you record will represent one vehicle while the number will represent the number of people in the vehicle. For instance, if an auto goes by with five people in it, you simply record the figure five in its proper column. List each vehicle separately.

8. Do not count babies or small children. (Under 5).

9. Record only traffic going in one direction. The Scout on the other side of the street will record the traffic going in the opposite direction.

10. At heavy traffic points where two Scouts may be assigned to each side of the street to check vehicles, one is to observe and call out and the other record.

11. Remain on the side of the street upon which the traffic which you are counting is going.

12. Scouts checking automobile traffic should not check street-car traffic, and Scouts who are assigned to checking street cars should not check automobile traffic unless otherwise instructed.

13. If in doubt at any time, use your own judgment and note what you have done.

14. Special instruction has been given to Scouts checking street-car traffic. In brief, these instructions are as follows:

Master Construction Glass-Overs for Sludge Beds

Because Port Washington, L. I., covers its Sludge Beds with our Glass-Overs, they could without offence, be located right in the park in the main part of the town.

Specialists

ALL of us might just as well admit, that in spite of the recent great advancements, the best of us don't know any too much about the Sewage Disposal question. But there are certain phases of it, that some of us have made a specialty of, and in which we are recognized as experts.

Take the Sludge Bed Glass-Overs, for example. It's safe to say, we have built three times as many as all other builders combined. Just naturally we have three times the experience.

However, that's not all there is to it, by any means. It happens that for over four generations we have been specialists in glass structures, such as greenhouses. One of our operations covered twelve and one-half acres under glass.

All of which means, we have developed a construction of such perfection, in both strength and the sunlight it transmits, that it makes the ideal one for Sludge Bed Glass-Overs.

It's called The Master Construction, because that's what it is.

As evidence of its acceptance by the leading engineers, let us send you a list of installations and the engineer for each.

Lord & Burnham Co.

Sludge Bed Glass-Overs

Graybar Bldg. New York | Continental Bank Bldg. Chicago | Harbor Com. Bldg. Toronto

Branch Offices: Boston, Philadelphia, Irvington, Denver, Kansas City, Cleveland, Buffalo, Greensboro, St. Louis, Montreal, St. Catherines.

The Main & West, Parselles & Genessee, Park & Dewey, Lake & Monroe cars seat 52 people. Trailers seat 70 passengers. Other cars seat 44 passengers. When possible count the number of passengers in the car. When this is not possible, as when the cars are filled or moving frequently, estimate the number of passengers in the following manner: Count or estimate the number of passengers standing or the number of vacant seats and add or subtract this from the seating capacity. You can estimate that a car with a full standing load contains about one hundred passengers.

DIRECTIONS TO BOY SCOUTS FOR MAKING PARKING COUNT

1. The main object of this count is to determine the number of automobiles parked in the congested district at 10:00 A. M.

2. For convenience, the parking is separated into the following classifications: Cars parked in
   a. 10-minute parking zones
   b. 30-minute parking zones
   c. 1-hour parking zones
   d. 4-hour parking zones
   e. Unlimited parking zones
   f. Loading zones
   g. No-parking zones
   h. Double-parking spaces

3. The check is to be made at 10:00 A. M., the morning of April 19 and be as nearly instantaneous as possible in order to avoid duplication. The check will be made by approximately 100 Scouts, each one of whom must count the automobiles parked, at that time, on the street or streets assigned to him.

4. Make the count in your territory as quickly as you can, being sure not to overlap any other Scout's territory. Walk along your street and record the *license number* of each car in its proper column and class on the sheet given you for that purpose. After you have finished your sheet, go back to the place of beginning and cover the same ground again one hour later (11:00 A. M.) All you need to do on this second check is to make a check mark after the license number of autos still standing in the 10-minute, 30-minute and 1-hour parking zones. Autos thus checked will be those overstaying their time limit. (They will *not* be reported to the Police.)

5. In the columns under "Illegal Parking" include automobiles parked on crosswalks, opposite a street intersection, within 10 feet of street intersections, with 10 feet of water hydrants, within 5 feet of driveways, within 5 feet of street-car stop signs, opposite or within 25 feet of a safety zone, within 2 feet of a mail box or within 10 feet of any zone which has been marked "No Parking" by the police. Estimate distances, as none of the violations which you report will be reported to the police.

6. If anyone asks you questions as to what you are doing—tell them that you are merely making a traffic check that has nothing to do with police enforcement. Don't waste time making explanations. Complete your check as quickly as possible. Consider cars being parked whether or not there is anyone in the car.

7. When the check is finished, be sure your sheet is turned in as soon as possible to the Scout Headquarters at the Chamber of Commerce.

Planning Commissions Urged for Every County in the United States

A PLANNING commission for every county, composed of the governing body and highway engineer of the county, with an advisory board of citizens if local conditions warrant, was strongly advocated by Committee No. 1 on Surveys and Planning in a report to the County Highway Officials' Division of the American Road Builders' Association, at the 1928 convention of that organization, held in Cleveland in January. Excerpts from the report follow:

"In order that needed improvements may be planned to the best interest of the community, and with economy, each county should have a planning commission. Many of the wealthier counties—those having large revenue and rapidly growing communities—have such a commission. Reports indicate, however, that very few of the "average" counties—those having low assessed valuation or sparse population—have a well-defined system of planning of improvements. The county planning commission is needed just as badly by the counties of the latter class as the counties whose revenues permit great expenditures. In the majority of cases where valuation is low, the mileage of roads is out of proportion to the amount of moneys available for road improvement. It is here as much as anywhere else that improvements and expenditures must be carefully and intelligently planned, for both the present and the future, in order that the public may enjoy facilities which they might otherwise be denied. . . .

"Before the planning commission can proceed with a well-defined plan they must necessarily make a comprehensive survey of economic conditions, apparent needs, and the financial condition of the community, considering the bonded indebtedness, if any, the rate at which same will be retired and the resources of the county, at the same time endeavoring to forecast as closely as possible future conditions and requirements. . . .

"Virtually every county is faced with the problem of expanding its highway system laterally while endeavoring to improve its main roads between important points. Great economic changes are taking place over the country, which, while gradual, nevertheless must be recognized and improvements planned accordingly if the county is to retain a place among the progressive communities.

"Particularly in those communities where soil is fertile and the population is not dense, a change is taking place in the gradual settling-up of the land by additional population migrating into the county. As a result of this we observe expansion of towns, rural subdivisions, and increased traffic, all of which is a forerunner of more homes, better markets, business buildings and intensive improvements. Each year we see many miles of county highways change in character from rural roads to city streets.

"County highway standards considered ultra-modern a decade ago are practically obsolete today. Not only are our pavements narrow, but we are in possession of thousands of miles of narrow right-of-way and of roads poorly located. Residents of the counties which have heavy intercity traffic know of the inadequacy of the pavement and roadbed widths and of the costs of widening the same. Millions of dollars are being expended annually for the widening of highways and boulevards, much of which could have been saved by a little systematic planning a few years ago.

"Subdividers of rural territory along county highways are prone to lay out their subdivisions with a minimum of right-of-way width along the highway. Especially is this the case where the road has been established by public usage and the county has no definite width of right-of-way. Real estate fronting upon a highway is usually most expensive and most intensively improved; thus it follows that when later conditions demand the widening of the roadway, the county usually has to condemn, and pay for, some very expensive right-of-way.

"With this in mind, we strongly recommend that this Association endeavor to effect appropriate legislation, in those states which do not already have such laws, which will require as a prerequisite to the sale of lands within such subdivisions the filing of a map and approval of the same by the governing body and planning commission of the county."

The most complete list of city planning commissions recently compiled, with in most cases the name of the chairman or secretary, is a feature of the MUNICIPAL INDEX for 1928, now in press.

Association of Airports Is Formed in Germany

German airports have formed an association consisting of 56 members in order to keep informed on technical advances in airport equipment, improved construction of hangars, lighting and signaling systems and other improvements, the office of the American Commercial Attache at Berlin has reported to the Department of Commerce. The full text of the report, as quoted in the United States Daily states:

All airports and landing fields are eligible to membership subject to approval. Fees are fixed at members' meetings and according to the probable cost of the coming year's affairs. A board of the association is composed of nine members appointed for two years, and committees may be appointed for certain work.

Ordinary meetings of members are to be held at least once a year, and extraordinary ones may be called by the board or on application of 10 members. Questions on which the association cannot agree, may be handled by the airports concerned separately.

Some of the fees and charges agreed upon are: starting and landing fees—for every 50 kilograms of an empty airplane—during the day (sunrise to sunset), 0.25 marks, during the night, 0.30 marks; housing in modern, fully equipped hangars (per square meter used), one day, 0.09 marks, one week, 0.30, one month, 0.90, special assistance and work, actual cost plus 50 per cent for wages, and actual cost plus 10 per cent for material.

In Step with Economy

Marble answers the ever-growing demand on the part of the American public for beauty—practical beauty—and economy in daily surroundings.

Its richness of texture, wealth of veining and unlimited color possibilities place marble in the front rank of decorative finishing materials.

But marble possesses more than the mere virtues of inimitable beauty and economy . . . much more. It is strong, durable, wear-resistant and impervious to moisture. It softens and diffuses all available light. It is inherently clean, and easy to keep clean. It is, in a word, the ideal material where utility and economy are essential, and beauty paramount. For buildings of every type—domestic, commercial or civic—

There is No Substitute for Marble

This interesting booklet illustrates and tells many facts about the practical applications of marble to home and commercial treatments.

A copy may be obtained—without cost, of course—by merely addressing Department 11-C. It will be sent you gladly, with our compliments.

NATIONAL ASSOCIATION *of* MARBLE DEALERS
ROCKEFELLER BUILDING · CLEVELAND · OHIO

MUNICIPAL ACCOUNTING AND FINANCE

Conducted by FRANCIS OAKEY, C. P. A.
Member of the Firm of Searle, Oakey & Miller, New York

The Audit of a City's Books

BROADLY defined, an audit is an ascertainment of the financial condition, transactions and operating results of a business or governmental entity. Such ascertainment consists of four main processes, namely:

1. Verification of the completeness, authenticity and accuracy of recorded transactions
2. Determination of the accuracy and soundness of the classification of transactions as applied to accounts of assets, liabilities, losses or expenditures, gains or revenues
3. Determination of all existing assets and of the accurate and sound value of each, including ascertainment that the required values are intact
4. Determination of all existing liabilities and of the accurate amount of each

The Necessity for Obtaining the Unrecorded Facts

To the auditor, books, records and supporting documents are representations only, the truth and completeness of which he must determine. The validity of available documents can, in most cases, be established, and the transactions and accounts recorded therefrom thus be verified. In some cases, however, documents which appear to be regular in all respects are not authentic. Again, transactions may have occurred which are not recorded and for which there is no documentary evidence. Consequently, an essential part of auditing consists in obtaining all unrecorded relevant facts and in confirming those which are recorded, as far as is possible.

Independence as an Essential to Effective Auditing

By its very nature an audit is an inquisitorial and critical process. Its purpose is to find and define all the facts which have a bearing upon financial condition and the results of operations—an undertaking which requires in respect to every relevant item of information, whether it is recorded or not, a verification to the point of certainty as to authenticity, accuracy and completeness.

Peculiarities of Municipal Auditing

The principles which have been outlined apply to all auditing, whether it relates to private or to public business. In municipal auditing, however, the essential processes differ materially from those which have been found to be efficient and sufficient in the auditing of private enterprises. This is due to many reasons, the chief of which are as follows:

A city differs fundamentally from a private enterprise in organization, powers, functions and purposes. Its organization, powers and functions are prescribed and limited by law in far greater detail than in the case of a private corporation. The purposes sought in the proper administration and operation of a municipality are to render and maintain in a state of sufficiency those services which its citizens require of it and are willing to pay for. The rightful purpose of a private enterprise is to make as large a profit and to acquire as much wealth as is possible, honestly and legally.

The revenues of a city are prescribed by law, not only as to the kind which may be raised, but also as to rate or tariff. Moreover, it is the intent of such laws to produce only that amount of revenue which is required to finance the authorized expenditures. Expenditures are limited by law, not only as to amount, but also as to scope, purpose or object.

The result of these conditions is that in the audit of a municipality the propriety of receipts and expenditures must be determined in the light of various classes of limitations, inhibitions and mandates provided by law.

The Organization Provided for Auditing

In most cities there is a chief accounting officer who is also the chief auditing officer. His title is City Auditor or City Comptroller. With the aid of a staff of bookkeepers, examiners and clerks, he performs the following functions:

Accounting functions:

1. The keeping of the controlling accounts of the city relating to assets and liabilities, expenditures and revenues
2. The keeping of detailed accounts of funds and appropriations
3. The keeping of detailed classifications of expenditures and revenues
4. The preparation of statements of financial condition and of financial operations

Auditing functions:

The audit of invoices and payrolls before payment.

Controlling functions:

1. The approval or disapproval of purchase orders and contracts after determining (a) whether the proposed expenditure comes within the scope and purpose of the fund or appropriation to be charged, and (b) whether, if incurred, the expenditure will result in the over-expenditure of the fund or appropriation to be charged
2. Recording the totals of taxes and assessments assessed and paid, thus establishing a basis for controlling accrual and collection
3. Keeping records of the accountability of officers charged with the collection of licenses and permits and the issuances of certificates or receipts therefor—this being accomplished by the use of financial stationery

The controlling functions enumerated above are also, in a sense, auditing functions, since they lay the foundation for the audit of the transactions to which they relate.

Auditing Processes Not Commonly Performed by the City Auditor

Generally speaking, the auditing work performed by the city auditor is confined to the audit of expenditures before payment. There are many essential auditing processes which he seldom performs, the chief of which are the following:

1. The audit of transactions and balances relating to taxes and assessments, including the verification of (a) penalties added, (b) interest added, (c) collections, (d) abatements, (e) refunds, and (f) the resulting unpaid balances. This consists of the audit of the tax collector's office
2. The audit of the collections of miscellaneous revenues, involving the examination of the records of the collecting departments
3. The audit of the city treasurer, involving (a) the verification and proof of all cash and securi-

21 years of heavy traffic and *practically no maintenance cost*

Bull Street in Savannah, Georgia, was paved with Trinidad Native-Lake Asphalt back in 1907, and while it is one of the city's busy highways over which lines of vehicles pass all day long, it is still in excellent condition after all these years.

Trinidad Lake Asphalt—made and seasoned by nature—possesses wear- and weather resisting qualities which are not to be found in any artificially produced bituminous paving material. Every day in all parts of the world Trinidad is demonstrating its long life and low maintenance cost, its attractiveness, resiliency, freedom from noise, and the ease with which it is kept clean and repaired.

Bermudez Road Asphalt—another of our native-lake products—is equally famous for *road* building. Write for interesting data.

The Barber Asphalt Company
Philadelphia

New York Chicago Pittsburgh St. Louis Kansas City San Francisco

TRINIDAD LAKE ASPHALT

Dug from the surface of Trinidad Asphalt Lake

ties held, (b) the examination and proof of the unissued and cancelled bonds of the city, and (c) the verification of receipts and disbursements

The audits described in the foregoing paragraphs involve a large amount of work, so large, in fact, that the city auditor or comptroller is seldom equipped with a staff adequate to undertake it. These audits are nevertheless important and should be performed if the funds of the city are to be properly safeguarded.

Other Important Considerations

It is obvious that the bookkeeper is unqualified to audit the accounts which he keeps. The city auditor or comptroller is generally the chief accounting officer of the city and as such is charged with keeping the general accounts and the fund and appropriation accounts of the city. Consequently, these accounts are seldom if ever audited.

One effective way for a city to provide for the audit of revenues, departmental collections, of the treasury, and the accounts of the city auditor or comptroller is to establish an independent and distinct auditing department to perform this work. The Federal Government has adopted this principle by creating the office of Comptroller General. The state of Virginia has an official entitled "Auditor of Public Accounts," who is entirely independent and distinct from the State Comptroller.

Another way for a city to provide for the essential audits which are now in most cases omitted, is to retain public accountants. This method has the advantage of obtaining the greatest degree of independence, provided, of course, the accountants retained are of the right character. If this course is adopted, it is important to obtain the services of accountants well versed in municipal work, because this field of accounting and auditing requires specialized training for satisfactory performance.

It is rare that the affairs of a city are adequately audited. Generally, audits of receipts and of the treasury are not made at all unless required by law or unless some allegation is made which raises suspicion. The result is that the funds of a city are seldom safeguarded to the extent which is common among business corporations.

—*Copyright, 1928, Francis Oakey.*

Comparing Split-Rate Bids on Municipal Bond Issues

A committee report adopted by the Board of Governors of the Investment Bankers Association of America, January 21, 1928. This resolution, which recommends to borrowing communities the adoption of the Memphis method of so-called net interest cost in determining bids on municipal bond issues, was presented by the sub-committee on municipal securities, of which Harry H. Bemis, of Curtis & Sanger, Boston, is chairman.

YOUR committee has been asked to suggest a formula to be used by state and municipal authorities in considering split-rate bids. Perhaps an explanation should be made of what a split-rate bid means.

Not many years ago it was customary for states and municipalities to make each loan mature on one date, payment being provided for by yearly appropriations from taxes which were placed in a sinking-fund. Theoretically, this amount was invested in such a manner that there were sufficient funds in hand to pay each issue at maturity. Actually, in the hands of municipal officials sinking-funds were often improperly administered, with a great deal of resulting confusion, for, as bonds matured, the funds for payment were not always available. The introduction of serial bonds with annual maturities has, where used, remedied this evil, since payment of each maturity was provided by a special levy in the annual tax budget.

In 1922 a resolution offered by your committee, recommending that all future state and municipal issues should mature serially, was adopted at that convention, and since that time many states have passed laws making this procedure obligatory, and it is now in general use.

With issues payable serially, municipalities desire to sell their bonds at as low a coupon rate as possible, providing the legal limit, usually par, is obtained. Because officials are not always able to foresee the coupon rate necessary, many loans are now advertised asking bidders to name rate or rates, usually stipulating that rate or rates shall be multiples of one-quarter per cent. This in turn has led to the situation where it is often possible to bid for part of the issue at one coupon rate and the balance at another, or even more than one. This is what is meant by a split-rate bid.

As different combinations of rates, amounts and maturities may be used by different bidders for any given loan, it becomes the task of the officials, aided by ingenious and ingenuous representatives of the bond houses, who may be present at the sale, to determine which bid is highest. Your committee is asked to suggest the method by which this may be determined with reasonable accuracy, bearing in mind that the system adopted should be as simple as possible, easy to comprehend, and should not call for intricate specialized knowledge.

There are two general methods of figuring: first, the exact basis; and second, the so-called net interest cost. The first, which is undoubtedly the more correct from a mathematical standpoint, is to use the serial basis books to calculate the net basis yield of each offer, awarding the bonds to the bidder offering the lowest exact basis. This method is complicated, and neither bond men nor city officials necessarily have the mathematical experience to use it successfully. Especially is this true where amounts are irregular, making its use difficult, if not impossible. There are three ways in use by which the above method may be worked out. This method, itself, is based on the assumption that premium received will be profitably employed by the municipality at compound interest, and that it makes a real difference to the taxpayer whether a greater or less amount of interest is included in the city budget in any one year, in preference to any other year; neither of which is likely to be true. In a word, neither the city nor the taxpayer is in the position of a corporation, which might expect money saved in interest in any one year to be profitably used as working capital.

The second and more simple method is stated in a recent circular of the city of Memphis as follows: "In comparing bids take the total of interest required to carry each issue through to maturity at the rates named in the bid. From the combined amount deduct the premium bid, and the remainder shows the net amount of interest to be paid by the city." This is the actual amount of money the borrowing community will have to pay out in interest during the life of the bonds.

The discrepancy in accuracy between the two methods is extremely small, shrinking as bids approach par; and split-rate bids are designed primarily, and certainly tend, to make the amount of premium offered as small as possible. Any theoretical loss to the borrowing community in using the net interest method is negligible in comparison with the importance of adopting a method of universal application, easy to understand and yet answering all practical needs.

Your committee recognizes that at times loans are still offered, part of which may be of a single maturity and part mature serially, and for which "all or none" bids may be made. Nevertheless, it seems to be one of those questions in dealing with which simplicity and workability by the average city official and bond man are the important factors, especially as the difference in mathematical accuracy is slight and the advantage of such accuracy, if any, is nullified by the reasons previously stated.

The object of this recommendation is to name a method which will be easy to understand, and avoid disputes now possible where city officials have no universal and accepted method of figuring bids, and which will allow all bidders to compete on equal terms. Therefore your committee recommends the second or Memphis method of so-called "net interest cost," and further recommends that borrowing communities stipulate in their notices of sale that this method will be used in awarding the bonds.

Low-Cost Roads—

the answer to your highway problems

A FEW years ago "Good roads at any cost" was the popular slogan. But this policy has been outlawed by experience. For, after all, good roads are a doubtful benefit when the expense of building and maintaining them is a serious burden.

Greater mileage of good, low-cost roads—that is the answer given today by scientific, impartial investigation.

In 1905 Barrett started work in the highway field. For twenty-two years this organization has been experimenting—working—accumulating information on all phases of low-cost road construction and maintenance.

A great fund of valuable, practical information has been gathered together. And this information is freely at your disposal.

A post card will bring the Tarvia field man.

Tarvia
For Road Construction Repair and Maintenance

The Barrett Company

New York · St. Louis · Detroit · Youngstown · Chicago · Salt Lake City · Milwaukee · Syracuse · Minneapolis · Baltimore · Providence · Cleveland · Toledo · Buffalo · Philadelphia · Cincinnati · Birmingham · Bethlehem · Boston · Kansas City · Lebanon · Columbus · Rochester

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Yes—we should like you to mention THE AMERICAN CITY.

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, *Attorney at Law*

Ordinance Requiring Sunday Closing of Bakeries is Upheld

In the case of Komen vs. City of St. Louis, 289 South Western Reporter, 838, the Missouri Supreme Court upheld the validity of an ordinance of defendant city forbidding the keeping open of bakery stores and bakeshops on Sunday after 9 o'clock a. m.

Cities Can Order the Demolition of Unsafe Buildings

"The police power of a municipal corporation to guard against unsafe buildings by ordering their demolition may not be questioned," declared the Kansas City Court of Appeals in the case of Lux vs. Milwaukee Mechanics' Insurance Co., 295 South Western Reporter, 847, in upholding the right of plaintiff to recover as for a total loss by fire where the municipal authorities required demolition of the part of the building that was not destroyed by fire. "The exercise of such power in a particular case may be erroneous and the power possibly may be abused, but it exists, subject to judicial control. However, the courts will not interfere except upon very clear grounds."

Acceptance of an Application for Water-Supply Requires Service Within a Reasonable Time

By accepting an application for water-supply, a municipal water department bound the city to supply water within a reasonable time, according to the view taken by the Maryland Court of Appeals in the case of Merryman vs. Mayor and City Council of Baltimore City, 138 Atlantic Reporter, 324.

It was also decided that where the city was supplying water to other consumers, similarly situated from a main in an intersecting street, it could not excuse failure to comply with the particular application on the ground that there was no main in the abutting street.

Furthermore, if it was necessary to construct a main in order to supply the water applied for, it was the water department's duty to so notify the applicant and permit him to pay the additional cost involved.

Charter Requirements As to Manner of Passing Ordinance Must Be Followed

A charter requirement that an ordinance be passed by a majority of all the members elect of a city council cannot be evaded by giving an enactment the form of a resolution, holds the Maryland Court of Appeals in the case of Mayor and City Council of Havre de Grace vs. Bauer, 137 Atlantic Reporter, 344.

In the same opinion it was held that such a measure could not be validated by the mere approval of the minutes of that meeting when read at the next meeting of the council. "Ordinarily," says the Court, "the approval of the minutes of a meeting is nothing more than a certification that they are a correct record of the things that were done at the meeting, and not an approval of those things."

But it was decided that where a resolution levying taxes was invalid, because not adopted by a sufficient vote, it was validated by an ordinance properly passed within a year after the date of levy.

Provision for Furnishing Electricity Free for Public Use Does Not Unjustly Discriminate Against Private Consumers

The village of Manchester, Ohio, sold its electric light plant under an ordinance requiring the purchaser to furnish the village with free electric energy for ten years for municipal purposes. A taxpayer attacked the transaction as being unjustly discriminatory against private consumers, but the local Court of Appeals said (Stone vs. Osborn, 157 North Eastern Reporter 410):

"The idea seems to be that if no levy is made for the purpose of paying for the light furnished in public places, those who do not use electricity will get the benefit of the public light free. This is certainly not very serious. Does not the inhabitant who pays no taxes get the benefit of public lighting free when the city pays for its light by taxation? And is there not then a discrimination in favor of such person and against the tax-payer? No scheme can be devised which will operate without some discrimination."

Self-Governing Powers of Cities Fail When They Run Counter to State Government

A section of the Ohio statutes forbids cities to charge for water supplied to public school buildings. A city possessing powers of local self-government under the state constitution adopted an ordinance requiring the local Board of Education to pay for water furnished to the school buildings of the city the same as other consumers. Annulling the ordinance, in the case of City of East Cleveland vs. Board of Education, 157 North Eastern Reporter, 575, the Court of Appeals for Cuyahoga County said:

"The Legislature, in exercising the power and performing the duty imposed upon it by the constitution in reference to public schools, acts for the whole state in reference to a matter affecting the whole state, and which by the constitution is made a subject of state-wide government.

"The municipality in this case, in establishing and operating a water-works system, acted in its proprietary function and in the exercise of its local self-governing powers for a very small part of the state. . . .

"There is therefore a direct conflict between two governmental agencies—the one local, and having to do only with local matters; and the other general, acting for the whole state, including the territory of the local agency. Under such circumstances, the power of a local agency of the government is subordinate to the power of a state-wide agency of the general government called upon to perform a state-wide mandate imposed upon it by the constitution.

"In Ohio, municipalities, whether operating under a charter or not, are not sovereign in any true sense."

Factors That May Be Considered in Determining the Validity of Gas Rates

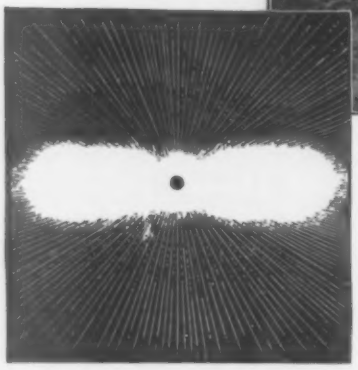
Where the reasonableness of natural gas rates was being determined, on a basis of the cost of reproducing the plant, etc., less depreciation, there should be included the cost of cutting and replacing pavement that was cut when the mains were originally installed, and not the cost of cutting and replacing pavements that would be involved in a present reproduction of the plant. Other items properly taken into account are: "undistributed structural costs," covering omissions from inventory, contingencies, administration, legal expenses, engineering, superintendence, inspection, taxes, and interest during construction, aggregating 17 per cent; "going concern" value, 10 per cent; allowance for extensions apt to be required during the life of the franchise under which the rates are fixed. The following items should be disallowed: estimates of pipe depreciation based upon study of samples not reflecting the general condition of the mains; valuation of long-abandoned mains, less 100 per cent depreciation, thereby increasing allowance for going concern value; debts assumed by company in taking over an artificial system of its predecessor later abandoned; legal and advertising expense incurred in preparing for rate litigation Gas rates enabling the company to earn 7.078 plus per cent on a fair valuation of its property are not confiscatory. (Columbus Gas & Fuel Co. vs. City of Columbus 17 Federal Reporter, 2d series, 630.)

Requiring a License to Distribute Advertising Matter Does Not Invalidly Interfere with Interstate Commerce

An ordinance of the city of Seattle forbids distribution of advertising matter from house to house unless a license be secured. In the case of Jell-O Co. vs. Landes, 20 Federal Reporter, 2d series, 120, plaintiff attacked the validity of the ordinance as applied to non-resident corporations. The company's policy is to distribute samples and recipe books to stimulate retail sales by its customers, and it contended that this constitutes an incident of its interstate commercial dealings with its customers, and that therefore enforcement of the ordinance would inter-

*Planned Lighting
with
Holophane Refractors

An installation of Planned Lighting on highway near Pontiac, Michigan. Planned by Lighting Engineers.



Light distribution of Holophane Asymmetric Refractor, Highway type, looking down from above.

Blinding Auto Headlights *not needed here!*

THIS installation of specifically designed Asymmetric Refractors is a perfect example of how Planned Lighting makes highways and streets essentially as useful and safe by night as by day.

Asymmetric Highway Refractors control the light and redirect it up and down the highway. Sufficient light is allowed to outline ditches and edges of the road. Very little light is wasted on fields or farms 'longside.

Adequate highway illumination is a mark of civic progress. To obtain it, location of unit, right spacing and mounting height, and proper distribution of light are essential. Our street lighting department can give you specific data for your particular needs.

Planned Lighting

is the name we have given to artificial lighting installations, planned by Holophane Lighting Engineers for specific application and which employ Holophane Specifics. (Holophane Symmetric and Asymmetric Refractors.)

HOLOPHANE COMPANY
New York & Toronto

Chicago **Milwaukee** **San Francisco**

HOLOPHANE

Yes—we should like you to mention THE AMERICAN CITY.

fere with interstate commerce. The gist of the reply given to this contention by the United States Circuit Court of Appeals, Ninth Circuit, is as follows:

"If manufacturers and wholesalers residing in other states can carry on an advertising campaign within a city by distributing samples and pamphlets in disregard of all municipal regulations, the police power of the state is far less comprehensive than has generally been supposed . . . In the present case, the appellant asserts the right to employ a number of agents to distribute the samples and pamphlets in question for a period of about two months in each year, and the imposition of a license fee of $10 per month for the privilege thus claimed is within the police power of the state."

A City and a Street-Railway Company Are Jointly Responsible for the Condition of the Parts of Streets Occupied by Tracks

"Even in the absence of a contract, a street-railway company is under an implied duty to keep in proper repair the portions of a highway occupied by its tracks," said the Pennsylvania Supreme Court in the case of Brobston vs. Borough of Darby, 138 Atlantic Reporter, 849. It was a case in which the borough was sued for injury to a motorist due to rough condition of paving. The opinion adds:

"Since the constitution of 1874, which requires municipal consent before entry upon the streets, such obligation is usually imposed in terms by franchises granted, and the duty to maintain the roadway is ordinarily made by agreement an express condition of the right to locate. But the obligation so assumed is a mere substitute for the common-law duty imposed when possession is taken of a public road. . . . If there is a failure to maintain, a recovery for the cost of necessary repairs may be had . . . under its [the street railway's] implied or express agreement to reimburse, . . . or if one is injured by reason of its negligence in regard thereto, damages may be recovered against it. . . . A similar duty to keep in proper repair rests on a municipality as to its streets, and the fact that another may also be used does not prevent an action against it."

Taxpayers May Prevent Compromise of Unfounded Damage Claims That Are Only Moral Obligations

A night policeman killed a drunken man at Wagoner, Okla., while attempting to arrest him. The decedent's widow sued the city for $10,000 damages and by consent of the parties judgment for $800 was entered against the city. But two taxpayers intervened, objecting that there was no legal liability on the part of the city, and that therefore the judgment by confession was illegal. Sustaining this contention and setting aside the judgment, the Oklahoma Supreme Court said (Moore vs. Crabtree, 258 Pacific Reporter, 916):

"The record amply justifies the conclusion that the pathetic spectacle of a widow with six small, fatherless children being deprived of the support and companionship of the husband and father at the hands of an employee of the city appealed very strongly to the sympathies of the City Commissioners, and when they found themselves confronted with a $10,000 lawsuit with the consequent expense and annoyance they, doubtless, thought it a good business proposition to make settlement, which the learned trial judge said he 'approved as a business proposition and as a matter of conscience.'

"We find no fault with this laudable desire on the part of the public officials, and from a strict business standpoint they may have been justified, but, as commendable as their attitude and desire may have been, such settlement and judgment cannot stand when properly attacked by taxpayers having the right to question the settlement unless such settlement finds sanction in the law."

Ordinance Against Disposal of Street-Railway Transfers Fails as Infringing Upon the Public Service Commission's Powers

An ordinance of the city of St. Louis declared it to be a misdemeanor for one to sell, exchange or give away a street-railway transfer ticket, for the purpose of enabling the buyer or donee to use it. In habeas corpus proceedings brought by one Packman, 296 South Western Reporter, 366, the Missouri Supreme Court declared the provisions to be void, for reasons stated as follows:

"The trouble with the ordinance is that it attempts to prescribe the use that may be made of transfer tickets, and thereby invades the province of the Public Service Commission. It will not do to say that the ordinance, in prescribing the use which may be made of transfer tickets, is not, or may not be, in conflict with the orders of the Public Service Commission relating thereto. The question is one of power. The city of St. Louis is without the power to regulate to any extent, directly or indirectly, the rates of a public utility, or to prescribe regulations or practices which affect such rates.

"But while it cannot exert any measure of control over the rate and charges of a utility, it can, no doubt, because of the public interest at stake in the maintenance of just, reasonable, and non-discriminatory rates, require under penalty that the individuals comprising the public shall in their dealings with the utility observe its rules and regulations affecting rates. This, however, is the limit of its power in that respect. If, therefore, the ordinance merely prohibited an issuance or use of transfer tickets which violates the rules and regulations of the street-car company (which would presumably have the approval of the Public Service Commission), the question of its invalidity on the ground of conflict with the state law could be wholly eliminated."

A Proposal to Zone the Lands Along the State Highways of Massachusetts

To the Editor of THE AMERICAN CITY:

Some, at least, of the people of Massachusetts are alive to the gravity of turning the New England roadside into offensive slums, so picturesquely deplored by Walter Prichard Eaton in his recent talk before the New England Council, as quoted in your February number.

With the hearty support of civic bodies throughout the state, which are unwilling to surrender the beauty of the New England wayside to commercialism without a struggle, the Massachusetts Forestry Association has introduced a bill the enactment of which by the General Court (as our state legislature is called) will mean the zoning of all state highways not already zoned. The bill provides that the State Division of Planning shall have the power to regulate the use of premises within 500 feet of the outer lines of the state highways in accordance with the principles of the state zoning enabling act, excepting such portions as are within cities or towns which have adopted, or shall hereafter adopt, zoning systems therein made possible.

It is further provided in the bill that anyone desiring to erect a building or structure or to use any land in such a zoned area for other than agricultural purposes, farm houses and buildings accessory thereto, including places for the sale by the occupant of products raised on the farm, and the growing of trees, shrubs, vines and flowers, shall apply for a permit to the local building inspector or to the selectmen.

When Massachusetts first came to be considered as a place for summer residence, the man who drove over its roads and had a chance to see things was greatly impressed by the beauty of the countryside. He found almost everywhere attractive village streets, overarched with elms, and bordered by attractive cottages. The country roads between the villages were equally attractive. The characteristic New England elm was everywhere in evidence, and the roads were lined with trees and native shrubs, with the gardens and grazing-lands in the background. The tone of the whole region was one of quiet dignity, peaceful, pleasing and restful, and it was just enough different from other similarly attractive regions to give it a character all its own. It was the New England atmosphere, climate, scenery, water areas, and a somewhat finished and even cultured development. The man who saw all this said, "This is a good place for a summer home."

So this visitor, and thousands like him, came and built summer homes, or lived in the hotels which rapidly developed for that kind of trade. The result was a new lease of life. There was much building and call for building materials. There was business for the merchants and for the growers of fresh garden products, for the milkman and the egg man.

Then came the automobile, and over night a few of the people of the region, joined by a few outsiders, bartered away one of the chief elements of the birthright of the state for a mess of pottage. The

F. M. motor-driven centrifugal pumps for fire and general service

Above, 100-hp. and 150-hp. F. M. Diesels

At right, 480-hp. F. M. Diesel and direct-connected alternator

"Revenues *steadily increased*---

and the 100-hp. unit and pumping equipment, installed in 1925, was fully paid for in the summer of 1926"

Rayville, Louisiana, supplies another episode in the Fairbanks-Morse Diesel development of Municipal Power Plants.

Starting in 1918 with a 75-hp. F. M. Diesel, purchased on a bond issue, Rayville added another 150-hp. unit in 1921. Revenue and load had increased by 1925 to a point that made it possible to purchase a 100-hp. engine and generating unit along with a 500-g.p.m. Underwriters' Fire Pump and a 300-g.p.m. Domestic Service Pump. These were paid for in monthly installments out of the revenue, without a bond issue.

Another increase in capacity soon became necessary, so a 480-hp. unit was ordered. Before this could be delivered, breaks in the Arkansas and Mississippi River levees flooded Rayville under 3 to 6 feet of water. The light plant, protected by sand bags, operated continuously through the entire period without service interruption.

After the waters receded the new unit was installed. Also a three-mile line extension was added.

Here is just another incident where Fairbanks-Morse Diesels have become a community's greatest asset, paying for themselves and making money for the town. They have given uninterrupted service under almost impossible conditions.

There is an answer to your town's lighting problems in our little booklet,—"Municipal Power Plant Developments." Write for your copy today.

FAIRBANKS, MORSE & CO., Chicago

Branches in all principal cities throughout the United States

FAIRBANKS-MORSE

DIESEL ENGINES

Preferred the F M *World Over*

Yes—we should like you to mention THE AMERICAN CITY.

"THEY SHALL NOT PASS!"

"TO BE OR NOT TO BE?"

beautiful roadsides are gone, or rapidly going. Traveling through the state, one encounters a veritable automobile slum, as Mr. Eaton has so well pointed out.

At first the stranger fell for all this, but he is beginning to wake up. Everywhere you hear him saying: "Thunder, this is not what I am looking for, I see enough of this at home. Who was it said New England was a pretty place?"

On top of all this is coming the gradual awakening of the people of New England and of the entire country, with, as one result, the above-mentioned bill.

In Bulletin 146 of the Massachusetts Forestry Association, issued January 16, 1928, Harris A. Reynolds, Secretary, explains the purpose of the bill:

"This bill deals only with the highways in which the state has a special interest. It merely provides that the state itself shall use the powers that have long been exercised by towns and cities. Fifty-eight cities and towns (about 82 per cent of the population), have already adopted zoning systems, and this bill applies only to the state highways in towns that have not done so. Zoning protects property and increases values. As it is today, the owner of a beautiful residence along a state highway within an unzoned town may have a filling-station or garage built on one side of his property and a hot-dog stand on the other. This situation may cause him heavy loss. Zoning as a rule causes inconvenience only to those who would profit at the expense of others.

"There is no question of the authority of the state to exercise this power. There is no conflict with local regulations. There is nothing new or revolutionary in this legislation. It is only a new application of the power of the state.

"The only thing that can retard this action by the state is the failure of the friends of the New England wayside to do their part. We have faith that the common sense in this proposal will be recognized. Let us tackle the problem with determination and settle it in the proper way. Piecemeal legislation has failed and failed miserably. The bill goes to the heart of the problem. The lesson of the Mohawk Trail has been learned—it points to but one conclusion—the state highways must be zoned."

The demand for zoned highways is echoed from every quarter. The people see in it not merely the difference between the original attractive environment and the present horrible hodgepodge, but they see in it the future existence and welfare of all the people of the region. If New England, if all America, is to be made but the conveyance of the ballyhoo artist, there will presently be nothing left to ballyhoo about, as the people will have all starved to death. It is really existence that the people of Massachusetts are fighting for in this instance.

EDWARD D. HARTMAN,
Consultant to Planning Boards, Division of Housing and Town Planning, Massachusetts State Department of Public Welfare.

Short-sighted Neglect by Municipalities of Segregated Negro Districts

THE Negro city population of American cities, which has increased by more than two millions in the last quarter-century, is largely confined to segregated areas where the Negroes themselves have little control over either the excessive crowding or the inferior living conditions, which inevitably result in high death-rate and impaired morals. The existence of these conditions in both northern and southern cities is shown by the findings of a survey made by the Institute of Social and Religious Research, as summarized by T. J. Woofter, Jr., director of the inquiry, in an article appearing in *The Survey* for February 15.* Significant excerpts follow:

"In no city studied was there evidence that Negro housing areas are effectively controlled by health, building, zoning and public-service departments. The health departments, seeking to reduce their mortality and morbidity rates, are least neglectful.

"Eagerness to squeeze profits from the land is responsible for most of the overcrowding in Negro districts. Congestion in cities has made some intensive use of land necessary; but in many instances the actual crowding caused by a desire for more than a fair return on the value of the land has increased until it has produced deplorable conditions.

"Congestion is due largely to conditions over which the Negroes have little control. They are obliged to go to segregated neighborhoods and nowhere else, and thus are subjected to vicious exploitation. This exploitation is often very loosely supervised by the municipality, so that both the land and the houses become dangerously overcrowded. The congestion is increased by the necessity for many families to take in lodgers either to pay high rentals or to meet substantial payments on homes under purchase. In these dense neighborhoods overcrowding saps vitality and moral vigor.

"There is no question that the inferior living conditions of Negroes contribute largely to respiratory, intestinal and venereal diseases, and to the high infant death-rate. It is also evident that wherever control has been undertaken, improvement immediately results. In Lynchburg, a highly organized and effective health department keeps down its rates through education and supervision. In Richmond, the health officer holds each nurse accountable for the death of any baby from intestinal disease.

"Negro neighborhoods are especially limited in municipal facilities for the use of leisure time. This is of outstanding significance, taken in connection with the crowded housing conditions which force so many of the young to find their recreation away from home, especially as conditions in many pool rooms, dance halls, and other commercial amusement places for Negroes were found to be deplorable.

"One of the most encouraging signs of advancement revealed by this study is the tendency among the Negroes toward home ownership. The number of home owners had increased materially in every city visited except New Orleans, and the increase from 1920 to 1925 in northern cities was especially rapid. In most cases the slum sections were relatively constant in population, with income and outgo about equal, while the population of the home-owning sections was increasing."

* A detailed report of the findings of the study just issued by the institute bears the title Negro Problems in Cities (Doubleday, Doran and Co., $2.50).

Efforts in Behalf of the Negro

are being made in many cities. Accounts of some of these from recent issues of THE AMERICAN CITY include:
ORLANDO, FLA., "An Idea Whose Time Has Come," March, 1927, p. 273. CHARLESTON, S. C., "City Dump Transformed Into Playground for Colored Children," August 1927, p. 164. DETROIT, MICH., "The Negro in Detroit (an 11-volume study, reviewed), May, 1927, p. 709. BUFFALO, N. Y., "Nationality, Color, and Economic Opportunity in Buffalo" (a study reviewed), September, 1927, p. 409. Also see page 166 of this issue.

LIGHTING EQUIPMENT THAT BRIGHTENS THE PATH TO PROSPERITY

THE prosperity of a city is best reflected in its street lighting. For your boulevards or business district we recommend the unit above which portrays that civic achievement. The cast iron standard is neat and strong. The Octolite Lanterns conform to the well proportioned double bracket. Inner Holophane refractors may be used if desired. Light center 17′-3½″ above ground. Octolite Lanterns No. 10059. Columbia Double Bracket No. 11004. Columbia Standard No. 11011. Write for detail drawings and prices.

Ornamental Street Lighting

A bulletin showing all the latest designs in ornamental street lighting equipment including ornamental brackets, glassware, cast iron and concrete standards and capitols. Your copy is waiting — write.

The History of Street Lighting

In 1415 Sir Henry Burton, Lord Mayor of London ordered all house holders to hang out lanterns in the winter evenings between All-Hallows and Candlemas.

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Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Recent Zoning Decisions

ILLINOIS.—*Brown v. Board of Appeals of City of Springfield*, 159 N. E. Rep. 225. The Illinois zoning enabling act permits cities to regulate and limit the height and bulk of buildings to be erected for the purpose of securing adequate light, air, fire protection, conserving taxable valuations, lessening congestion, and promoting public health, safety, comfort, morals and welfare. A city ordinance required that buildings erected within certain areas should be not less than 40 feet in height. *Held* that the ordinance was not authorized by the zoning enabling act.

It was claimed that the purpose of the ordinance was esthetic and void for that reason as an illegal use of the police power. The Court declined to pass upon the constitutionality of the use of the police power for esthetic purposes, saying that it was sufficient that the zoning enabling act did not authorize esthetic regulation.

MARYLAND.—*Bauerschmidt v. Standard Oil Company of New Jersey*, 139 Atl. Rep. 531. That a permit to erect a gasoline filling-station was invalid because of the invalidity of the ordinance under which it was issued, would not authorize suit by a private citizen to enjoin the erection of the filling-station as a public wrong, without alleging or proving special damage.

NEW JERSEY.—*Township of Maplewood v. Margolis. (two cases), U. S. Supreme Court*, reported in *U. S. Daily*, January 17, 1928. Appeal by the township from decisions of the New Jersey Court of Errors and Appeals holding the zoning ordinance invalid. The United States Supreme Court refused to grant the township a writ of certiorari. No opinion.

VIRGINIA.—*Bragg v. Ives*, 140 S. E. Rep. 656. An undertaking establishment which invades a strictly residential district and subjects nearby residents to noxious odors and gases to the extent of rendering their homes physically uncomfortable, or which exposes the occupants to danger of contagion or disease, or which has the effect of depressing the spirits and sensibilities of residents so as to weaken their power of resisting disease, and depreciate the value and enjoyment of their homes, constitutes a nuisance. No business, however lawful and necessary in itself, has a right to interfere with the physical enjoyment and comfort of the home.

WYOMING.—*Wikstrom v. City of Laramie*, 262 Pac. Rep. 22. The plaintiff secured a building permit to construct a private garage and shop on a lot owned by him situated in a residential district. He immediately commenced its construction, and had excavated the basement, cemented the walls, put in a concrete foundation, laid the joists for the floor, and partly laid the floor when the city attempted to cancel the permit.

Held that this action was unwarranted. "As a general rule, when a city council or the proper city officer, in the absence of fraud, grants a permit for the construction of a building and the party acting on the faith thereof commences the erection of a building, he acquires something more than a mere license, something in the nature of a vested right, and the permit cannot then be revoked by the city." The authorities cited.

The city is not liable in damages for the wrongful revocation of a building permit by its council, since the officers of the city are acting in a governmental capacity. Cases cited. The passing and enforcement of zoning ordinances is a governmental function.

Recent Zoning Literature

THE NEW YORK CITY ZONING RESOLUTION

The Municipal Engineers Journal, 29 West 39th Street, New York City, in its third quarterly issue for 1927, contains a paper presented to the society entitled "The Operation of the New York City Building Resolution." The paper was written by Vernon S. Moon, Assistant Engineer, Board of Estimate and Apportionment of the city, and discussed by Arthur S. Tuttle, its Chief Engineer, Edward M. Bassett, Counsel of the Zoning Committee of the city, and others. The paper is a history of zoning in the city, and an intimate and detailed discussion of the problems that have arisen and the measures that have been tried in their solution. These problems are the problems, actual or potential, in most other cities, and the paper is therefore of interest in them as well as in New York City.

The Bulletin of the Board of Standards and Appeals of the city for January 17, 1928, gives the Annual Report of the Board in considerable detail.

The *Baltimore Municipal Journal* of January 9, 1928, sums up the work of the Board of Zoning Appeals of the city for 1927 in an item headed "Zoning Appeals Drop; Builders Respect Law." Since 1924, the first full year of the body's existence, the number of cases heard by the body has decreased from a peak of 303 in that year to 133 hearings during the last twelve months.

Of last year's 133 appeals to the Board from decisions of the Buildings Engineer, 84 were approved, 25 of them conditionally, and 55 disapproved. In addition to the work of hearing these appeals, the Board passed on a total of 58 ordinances submitted to it for recommendation by the City Council, making a total of 191 public hearings held during the year. The period just ended was notable for this feature, showing an increasing tendency of the Council to attach weight to the Board's views on zoning and building questions.

Are Your Citizens Getting a Square Deal in Assessments for Taxation?

By J. M. CLEMINSHAW

REAL estate bears most of the burden of local taxation. Assessed valuation is the very foundatnon of our taxation system. In proportion to equality in assessments for equal values is there fairness in the amount of taxes paid on real estate? If the real estate of one home owner is assessed at 80 per cent of its value, and that of another at 40 per cent, the city average being, let us say, 60 per cent, the one home owner is actually taxed for one-third more than his proportionate share; while the taxpayer whose property is appraised at 40 per cent is paying only two-thirds of his proportionate tax. This is a very common condition, brought about chiefly through indifference and lack of knowledge on the part of city officials.

Inasmuch as the general property tax has increased greatly in recent years, local taxation has become a matter of vital concern. Property owners are demanding relief wherever relief is possible. One evil that can and must be eliminated is arbitrary valuation for tax purposes. Appraisal methods in many cities permit of gross inequalities and an opportunity for favoritism. Intelligent and constructive city officials, chambers of commerce, citizens leagues and other civic organizations are giving definite thought to methods for equalizing property assessments.

A great deal of time and study has been given by appraisal experts to methods for the scientific and equitable valuation of land. Practically all systems are agreed in basic principle, that of the establishment of front-foot values for a given depth. Depth and corner influence tables may vary somewhat, but results are practically the same if the rules are intelligently applied.

The establishment of land values is no problem at all as compared with the accurate, scientific and equitable wholesale valuation of buildings.

Building Value Defined

Lawson Purdy gives us a simple, yet accurate definition of building value. He says, *"The full value of a building is the sum which the presence of the building*

Safeguard YOUR STREETS with COPPER and BRASS PIPE

WHEN Copper or Brass is used for water service pipe, municipalities and property owners are not confronted with the expense and inconvenience of tearing up their streets, lawns and pavements. For Copper and Brass are the best pipe made. They CANNOT RUST and therefore will not leak or burst. Copper or Brass pipe gives satisfactory service for a lifetime.

It is true that Copper or Brass costs slightly more than the best grade of corrodible metal. But after a few years of service they prove much cheaper because they do not require costly replacements.

Corrodible water service pipe soon rusts. Then it either becomes choked up or bursts. Expensive repairs follow. Streets and lawns are torn up to make replacements.

One substantial repair bill, made necessary by *corroded* pipe, means a greater total outlay than your investment in *rustproof* Copper or Brass pipe.

Our Technical Department will gladly co-operate with you on water service pipe. There is no cost or obligation.

COPPER & BRASS
RESEARCH ASSOCIATION
25 Broadway, New York

adds to the value of the land." This is a fact often lost sight of when valuing property. Nearly all assessors and engineers have their pet rules and formulas for valuing buildings, the most popular one being the cubic-foot method. Total costs of buildings recently erected are obtained and their actual cubic-foot cost computed. These costs are then used as a basis for valuing similar properties. It is often overlooked that a few slight changes in construction, in ground area and in height will alter the cost to such an extent that one's best estimate of the cubic-foot cost may be from 10 to 20 per cent off. The idea that "cost to replace new less depreciation" is fair and sound value seems to persist in the minds of many of those who should know better. Improper consideration of location, obsolescence and earning capacity, with rule-of-thumb depreciation, applied by a number of men of widely varying opinions, can result only in making an attempted revaluation a rather dull failure.

Judgment an Important Element in Valuation

The revaluation of a city should be made by as few appraisers as possible. Judgment is an important element in valuation, and the less variation in judgment the better.

Dwelling properties represent the greatest number of individual properties, and if all things are to be kept in their right proportion it follows that the most time and thought should be spent on the equitable valuation of these properties. It is quite impossible to value dwellings equitably without first establishing their sound physical value as a basis for valuation. With but few exceptions, the fair sale value of dwellings bears a direct relationship to physical value.

The development of square-foot costs of houses of various areas, types, and construction, with schedules of cost variations from base, properly checked and tested, should be the first step. It will be found that certain types of houses in a certain district have a fair sale value, a certain percentage above the physical value plus the value of the land. In another district the percentage may be less. Again, there will be rows of houses in the more undesirable sections whose fair sale value will run something less than the physical value. It will be found, however, that the ratio will, as a general rule, hold true for each district.

Fine old houses, structurally sound and costly to replace yet poorly located, frequently have a fair sale value of but 30 per cent or 40 per cent of their physical value.

Factors Affecting Business Property Valuations

In the matter of establishing the valuation of business properties, location and earning capacity as well as physical value are of prime importance. The values applied to land, however, will usually take care of the location factor. Many small cities have dozens or even hundreds of three- or four-story commercial buildings worth no more than adjoining buildings of the same ground area yet only two stories high. The fact is that the third and fourth stories will frequently not bring in sufficient income to warrant their maintenance. Normal income properly capitalized should be a factor of great importance. It must also be borne in mind that some buildings cost twice as much to own as others; therefore, in order to be of any value, the rate of capitalization must needs be worked out for each structure.

The valuation of industrial property for taxation generally presents a knotty problem to the assessor. Almost invariably these values are established by compromise. As a result of compromise valuations, the greatest inequalities are generally found among the assessments of manufacturing plants.

It is generally conceded that cost to replace new less depreciation represents fair valuation of a modern plant to a full going concern, provided the property is wholly adequate; however, very few manufacturing plants are modern or fully adequate. Morover very few manufacturing companies can be regarded as full going; they are usually somewhere on the road between "full going" and bankruptcy. There isn't one manufacturing company in a hundred that would exactly duplicate its present property if required to replace. Obsolescence, inadequacy, surplus construction, and lack of earning capacity make tremendous differences in the valuation of most industrial plants.

Despite all the difficulties encountered in the valuation of real property, it certainly is possible to have a thorough and just valuation when truly scientific methods are employed with common sense and sound judgment.

A Prize Competition to Interest Children in Accident Prevention

MUNICIPAL officials and civic organizations may be glad to give local publicity to a prize competition just announced by the National Safety Council. It is addressed to school children, and reads as follows:

"If you're a boy or girl, it may pay you to find five flaws in the accompanying photograph. Fifty cash prizes will be awarded by the National Safety Council to boys and girls who are students in public, private and parochial elementary, preparatory and high schools, for the best essays pointing out the faults in the picture.

"The awards: first prize, $25; second prize, $10; third prize, $5; four prizes of $3 each; five prizes of $2 each and thirty-eight prizes of $1 each. The purpose of this contest is to induce people to think more about the prevention of accidents on the streets and highways which last year took a toll of more than 24,000 lives.

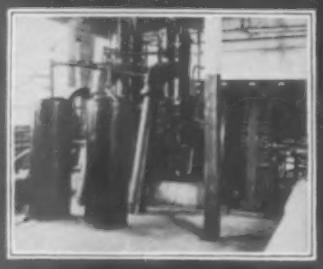
"Entries should be sent to the Picture Puzzle Contest Director, National Safety Council, 108 East Ohio Street, Chicago, Ill. Each composition should present, in the upper left-hand corner, the full name of the pupil, age, grade and the name and address of the school. Be sure to identify your composition, giving the complete address of your school, street, city and state. No entries will be returned. The contest will close on May 1, 1928.

"Boys and girls can talk to their relatives and friends about the incorrect features of the photograph, but each composition must be original. Please limit your essay to not more than 300 words.

"There is nothing concealed in the picture. The flaws are plainly pointed out and should be obvious after a little study. There are certain unsafe practices shown which shouldn't be indulged in by motorists who want to reduce accidents. Study the manner in which the machine is parked. Note if the car has the necessary equipment. Is there anything shown that should have received attention by the city officials?"

"WHAT IS WRONG WITH THIS PICTURE?"

This photograph is being used as the basis of the prize essay competition on traffic accident prevention, above mentioned



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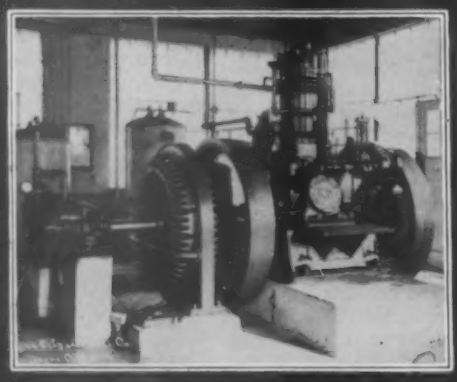

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Cost of Government in the United States, 1925-1926.—National Industrial Conference Board, Inc. New York. 1927. vii + 294 pp. $3.50.

The business of government is the third largest business in the United States. The community pays the governmental bills. Hence, the responsibility for placing government upon an efficient basis will continue to rest with the intelligent element of the citizenship. With something of this point of view, and with the conviction that the first step is a better and more widespread knowledge on the part of those who pay, of facts concerning the financial position of the business of government, the National Industrial Conference Board, issues this latest, and the fifth, of its series of studies. The volume contains data on Public Expenditures and Public Debt; the Volume of Taxation, and the Geographical Distribution of Tax Collections; and the Social and Economic Distribution of Tax Burdens. Also, Fiscal Aspects of Education, and Fiscal Aspects of Highway Construction and Maintenance, are presented, with a chapter on Taxpayers' Associations, and a General Summary with Conclusions. Voluminous tables and charts supplement the text.

Citizenship Through Problems.—By James B. Edmonson, Professor of Secondary Education, University of Michigan; and Arthur Dondineau, in charge of Supervision of Instruction, Detroit Public Schools. The Macmillan Co., New York. 1928. 550 pp. $1.60.

This textbook on community civics differs from many others on the same topic in its emphasis on actual investigation and "learning through participation." It is divided into six main parts: The Meaning and Obligations of Group Life; Problems of Community Welfare; The Individual and His Economic Well-being; Problems of the Economic and Industrial Life of a Community; The Machinery of Government; and the Appendix, containing the Declaration of Independence, the Constitution, a simplified parliamentary procedure, a recommended school library list of 14 books, and other sections for teachers. There are numerous effective illustrations, many of which carry questions as sub-captions to bring out their application.

Seven Years of City Planning, Buffalo and Environs.—An address in which Chauncey J. Hamlin, retired President of the Buffalo, N. Y., City Planning Association, recounted, before that body, the milestones of progress already passed in the carrying forward of the Plan to final achievement. In *City Facts*, January, 1928. (Apply to the publication, 110 Delaware Avenue, Buffalo, N. Y.)

Country Planning in the Ruhr District.—By Dr. Robert Schmidt, Director of Town Planning for the Ruhr Region. A paper read before the Town Planning Institute (London) in which the self-governing, corporate body, the Regional Planning Federation, of the Ruhr, is described, together with its methods of dealing with such problems as traffic, housing, and the provision of open spaces. Six pages, illustrated, with discussions appended, in the *Journal of the Town Planning Institute*, January, 1928, the address of which is 11 Arundel Street, London, W. C.

Suburban Forest Preserves.—By Forrest Crissey. A 4-page article in *American Forests and Forest Life*, February, 1928, describing the Cook County, Illinois, Forest Preserves, the 30,500 acres of which are in active use by the people. Illustrated. 35 cents. (Apply to the magazine, 1523 L Street, Washington, D. C.)

Report of the Portland City Planning Commission on a Major Traffic Street System.—A 32-page report illustrated with charts, maps, and photographs, submitted to the public for discussions and recommendations, December, 1927. It falls into two major divisions: a general discussion of the necessities for planning; and the major traffic street plan. (Apply to J. C. Ainsworth, President of the Commission, Portland, Ore.)

The Community Use of Schools.—By Eleanor T. Glueck, Research Assistant, Milton Fund Project in Criminology, Harvard University, 1925-1928. Williams and Wilkins Company, Baltimore, Md. 1927. xiv + 222 pp. $3.00.

This is a remarkably complete study of a social and educational problem of tremendous scope. The author has had the cooperation of the National Community Center Association, the United States Bureau of Education, State University Extension Divisions, State Departments of Public Instruction, and other institutions and agencies in a nation-wide survey of the field. With the results of this survey as background material, she has proceeded "to examine the schoolhouse as an instrumentality for the organization of neighborhood life,—civic, social, and recreational," answering incidentally all such questions as these: What is the nature and extent of the use of schools for community purposes in the various states? What differences are there in the character of school centers in urban and rural districts? What is the nature of the administrative machinery for the community use of schools? To what extent is there democratic control? What is the relation between self-government and self-support in school centers? In showing the present extent and character of community use of school buildings, Dr. Glueck has afforded a point of departure for study and discussion as to future developments. To quote from the foreword, by Dr. Henry W. Holmes, Dean of the Graduate School of Education, Harvard University, "It is to be hoped, indeed, that this volume and other studies and discussions in the same field will eventually result in definite provisions for the community use of schools throughout the country."

Report of the New York State Tax Commission, 1926.—This annual publication is a substantially bound volume of 499 pages. It is issued as State Legislative Document No. 7, 1927, and contains, as in former years, a vast amount of detail statistical matter concerning state and local taxation in New York, with a table (corrected to the summer of 1927) showing the "Status of Certain Tax Matters in the Various States." Laws relating to taxation enacted in 1926, and New York tax decisions during 1926 are among material included, in addition to the statistical tables which make up the bulk of the volume. (Apply to J. B. Lyon Co., Printers, Albany.)

A City Planning Primer.—Prepared by the Advisory Committee on Zoning, Division of Building and Housing, Department of Commerce; John M. Gries, Chief. This is a printed edition with foreword by Secretary Herbert Hoover, of the City Planning Primer issued in preliminary, mimeographed form in February, 1927, a substantial part of which was published in THE AMERICAN CITY, January, 1927, pp. 89-95. 5 cents. (Apply to Government Printing Office, Washington, D. C.)

Patterson Park, Baltimore.—Pamphlet No. 2 of a series entitled "Public Parks of Baltimore" being issued by the Board of Park Commissioners gives the hundred years' history of Patterson Park, with descriptions of its present-day recreational facilities, including the commodious new musical pavilion and radio broadcasting station. This series is typical of the generally informative literature which park departments are using to educate the public of their cities to wider interest in parks. (Apply to J. V. Kelly, Secretary, Druid Hill Park, Baltimore, Md.)

Cincinnati in the Future: Its problems and Responsibilities.—By Alfred Bettman. A 31-page article in The Women's City Club *Bulletin*, Cincinnati, issue of February, 1928, in which the city charter, the city plan, public utilities programs, and financial administration in that city are discussed, with emphasis placed upon the importance of intelligent citizens' organizations and the creation of intelligent public opinion. (Apply to the Club, 528 E. Fourth Street, Cincinnati, Ohio.)

Principles of Public Administration.—By W. F. Willoughby, Director, Institute for Government Research. The Johns Hopkins Press, Baltimore, Md. 1927. 720 pp. $5.00.

This volume is the fifth and largest of the series on Principles of Administration published by the Institute for Government Research, at Washington, which has also issued 16 books on Studies in Administration and numerous Service Monographs of the United States Government. The book at hand is a systematic treatise presenting a general analysis and picture of administration as a branch of political science. It proceeds from a realization of the immense importance of administration in present-day government, as compared with the older emphasis on electoral, legislative and traditionally executive functions. It is written for students of political science and officials having to do with general legislation and administration, rather than for administrative technicians. Although its emphasis is on the national and state governments, it has much of value to students of local government.

Codification of Ordinances.—By E. D. Greenman, Assistant Director, New York State Bureau of Municipal Information. This is Publication Number 6 of the Municipal Administration Service, and is a "practical manual of procedure." It discusses the need of codification, and suggests a model outline for administrative and penal codes. 49 pp. 25 cents. (Apply to the Municipal Administration Service, 261 Broadway.)

Toledo's Play Progress in 1927.—An article reviewing the city's recreational status and recent progress made, as based upon the annual report of the Recreation Commissioner for 1927. Two pages in the *Toledo City Journal* (Ohio), issue of February 11, 1928. (Apply to the Commission of Publicity and Efficiency.)

Fees for Licenses and Permits.—A report, with recommendations, made by the Budget Commissioner of Boston, Mass., to the City Council, October 15,1927, suggesting greater use of city fees in order to relieve the real estate burden. New legislation is recommended "providing that fees be fixed by the City Council with the approval of the Mayor," together with recommendations for the creation of a Central Permit Bureau, and a schedule of licenses and permits. City Document 99, 1927. (Apply to the City Clerk.)

Birth, Stillbirth, and Infant Mortality Statistics for the Birth Registration Area of the United States, 1925.—This is part 1 of the eleventh annual report on this subject issued by the Bureau of the Census, Department of Commerce. The 246 pages are devoted to rate tables and general tables. The descriptive and explanatory text will be presented in part II, which will also include the text for Mortality Statistics, 1925. 60 cents. (Apply to Government Printing Office, Washington, D. C.)

Amounts Raised by Community Chests and Welfare Federations.—Bulletin No. 18 of the Association of Community Chests and Councils shows figures covering amounts raised by community chests and welfare federations in the United States and Canada for the years 1925-1928. Figures are given by cities, grouped according to population. (Apply to the Association, Graybar Building, New York.)

Municipal Recreation in Oakland.—A 38-page bulletin published by the Recreation Department of Oakland, Calif., to inform the public fully of the play facilities at its disposal. A well-made piece of public recreation publicity attractively illustrated. (Apply to R. W. Robertson, Superintendent of Recreation.)

Minneapolis Traffic Ordinance.—Published in a compact 62-page pamphlet for distribution by the Police Department, "for the guidance of the public in the use of the streets to lend cooperation and assistance in the promotion of convenience and safety." Indexed. 1928. (Apply to Frank W. Brunskill, Superintendent of Police, Minneapolis, Minn.)

An Outstanding Project in 1927—

THE MOUNT AIRY RESERVOIR AT CINCINNATI STANDPIPES FABRICATED AND ERECTED BY P. I. W.

Among the outstanding jobs reported by **Engineering News-Record** for 1927 was the mammoth, 8,500,000-gallon reservoir and pressure equalizer at Mount Airy, Cincinnati, Ohio, comprising 14 P. I. W. built standpipes of the following dimensions:

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Parks: A Manual of Municipal and County Parks.—Edited by L. H. Weir. With a foreword by President Coolidge. 2 volumes. xiv + 1019 pp. Illustrated with 346 maps, charts and photographs. A. S. Barnes and Company, New York. 1928. $15.00.

This exhaustive work is based upon a nation-wide survey undertaken by the Playground and Recreation Association of America in cooperation with the American Institute of Park Executives at the request of President Coolidge following his first National Conference on Outdoor Recreation. Under supervision of L. H. Weir, Director, and a national committee formed for the purpose, practically all incorporated communities of 8,000 population and over were personally visited, and data were obtained from smaller incorporated places by questionnaire. Thus there resulted such an array of facts, figures, diagrams, and photographs as has not been heretofore assembled. The actual scope of the book is much greater, even, than its title indicates. The introductory explanation, "Old Parks and New" fixes a definition for the word "park" broad enough to include playground and recreational areas and to bring all matters of their administration, finance, programs and activities within the field of study. Chapter-end bibliographies, and a final chapter of references to general published material on parks, add greatly to the practical value of the work, making it virtually the equivalent of a series of handbooks on the subjects it includes.

A discursive examination on "Why Parks?" is followed in Volume 1 by chapters on "General Planning of a Park System," "Examples of General Municipal and County Park Planning," "Elements in the Design of Park and Recreational Areas," "Construction Notes," "General Administrative Control of Parks," and "Park Financing."

Volume 2 contains a group of chapters on what are popularly thought of as the more technical and specialized departments of the subject, including "The Park Engineering Division," "Horticultural Division," "Zoological Parks and Aquariums," and "Botanical Gardens," with other chapters on such subjects as the policing, lighting and sanitation of recreational areas, and on the general maintenance of park properties.

No running list of topics, however, will give an idea of the tremendous amount of information given under the various headings. Chapter 3, for instance, contains 37 pages made up chiefly of statistical data on park programs of cities, divided into population groups, with specific descriptions from a few cities under each classification showing in detail information concerning their parks, school sites, and other recreational areas, and with an added section devoted to county park facts and figures. The chapter in Volume 2 devoted to the Recreational Service Division contains elaborate information on play programming, discussing forms of popular recreation ranging all the way from county recreation day programs to puppet theaters, and from athletic leagues to stilt walking.

The Goal of May Day—A Year-Round Community Child Health Program.—Prepared by the Division of Publications and Promotion in Collaboration with the other divisions of the American Child Health Association, 370 Seventh Avenue, New York. 79 pp. Illustrated. May Day is Child Health Day. This pamphlet is full of information as to organizing the protective and educational measures for child health that May Day now presents and stimulates. Actual results are shown, and a plan is given for coordinating the health work of all community groups and national organizations. The material is comprehensive and definite and most interestingly presented. (Apply to the American Child Health Association, 370 Seventh Avenue, New York.)

Vermont Goes Ahead.—Volume 2, No. 2, of *Vermont Progress*, official publication of the Vermont State Chamber of Commerce for February, 1928, is devoted principally to authoritative articles on the restoration of the railroads, and activities and plans of the Vermont Highway Department after the flood. Reveals the new will-to-achieve in which Vermonters in overcoming a great disaster, have set out (in the words of Governor John E. Weeks), to "remake Vermont a better and nobler state, and ourselves a people of greater fellowship and grander achievements." (Apply to the Chamber, St. Albans, Vt.)

Recreation and Amusement Among Negroes in Washington, D. C.—By William H. Jones. Derricotte and Company, Washington, D. C. 1927. xv + 216 pp. $2.60 postpaid.

A new book by a negro author. It is based upon thoroughgoing, first-hand studies begun in 1925 by the Howard University Department of Sociology, of which the author is a professor. The material as presented falls into four chief divisions: Non-Commercial Recreation; Commercial Recreation; Some Behaviour Sequences of Inadequate Amusement and Recreation; and certain conclusions and recommendations arrived at as a result of the findings of the study. One of the chief conditions shown as existing in Washington to a greater extent than in other leading American cities is the biracial organization of society. This, by inference, has a good and a bad side, tending on the one hand to develop organized expression of certain racial gifts as a contribution to the cultural and recreational life; but on the other hand operating to cut off the intellectual and unsocial elements from all participation in more conventional leisure-time pursuits such as their tastes dictate. The work is characterized by a dignity of scholarship in the marshaling of facts and a soundness of conclusions based thereon; and while it discloses certain glaring deficiencies in negro recreation in Washington as measured against the ideal, it indicates a vitality of spirit among those meeting the problem which argues well for continued progress.

The Problem of Vocational Guidance.—By George E. Myers. Professor of Vocational Education and Guidance, University of Michigan. The Macmillan Co., New York. 1927. 311 pp. $1.60.

The haphazard and wasteful method or lack of method in the finding of jobs on the part of the 1,500,000 young people who turn from school to work each year in the United States, and the way in which vocational guidance seeks to meet the problem, are the subject-matter of this book, which is intended for parents, social workers, and teachers in general as well as for those more directly in guidance work. Vocational education and the technique of guidance and placement are simply and lucidly dealt with. Discussion of the supply of jobs, and the factors relative thereto, is evidently regarded as beyond the scope of the book.

Digest of Vermont Transportation Survey.—A 10-page report in *Public Roads*, December, 1927, of a cooperation survey made by the Vermont Highway Board and the United States Bureau of Public Roads to determine the present and future importance of various sections of the state highway. Elaborately illustrated with photographs, maps and charts. 10 cents. (Apply to Superintendent of Documents, Government Printing Office, Washington, D. C.)

Proposed Building Ordinance.—A brochure of 11 pages issued by the Portland Cement Association, 33 West Grand Avenue, Chicago, Ill., December, 1927. Designed especially for smaller municipalities where there is no separate building inspection department in charge of a full-time building official. The city engineer or some other official would have the responsibility for enforcement. A modern building ordinance in a small municipality is valuable because of the definite construction regulations therein established, and because of its enforceableness. The document is arranged to take full advantage, through adoption by reference, of reports issued by the Department of Commerce Building Code Committee and other national bodies. Section 27 of the ordinance lists such publications. Adoption by reference is not sanctioned under the laws of all states, but suggested alternative practice is also given. (Apply to the Association.)

A Study of the Traffic Problem.—William S. Canning, Engineering Director of the Keystone Automobile Club, has provided a thoughtful, complete, and scientifically organized report of 32 pp. on present traffic problems of city, county, state and borough. The best precedent in making traffic studies has been followed, and numerous charts have been used to show factors influencing general conditions. The study will be suggestive to state-wide and sectional organizations, as well as to traffic officials, elsewhere. (Apply to the Club, 250 South Broad Street, Philadelphia, Pa.)

Lockstep and Corridor.—By Charles L. Clark and Earle Edward Eubank, Ph.D. The University of Cincinnati Press. 1927. 177 pp. $2.50.

The first-named author, whose account of 35 years in prisons and other penal or correctional institutions distributed among ten separate convictions, constitute the body of the book, is at present in the Vandalia honor farm colony of the Illinois State Penitentiary, where he wrote his autobiography at the suggestion of Professor Eubank, head of the Department of Sociology at the University of Cincinnati, who had become acquainted with him in 1918. The book constitutes an absorbing and generally convincing story of influences, customs and occurrences in the underworld, particularly among professional thieves. Thirty pages following the narrative are taken up by observations and conclusions of the second author, with special reference to the general social implications of the case.

Should the Construction of Houses Be Discouraged at This Time?—By Bernard J. Newman, Managing Director, Philadelphia Housing Association. Following public declarations that there was an overproduction of thousands of dwellings in Philadelphia and that all building projects should be curtailed for a period of two years, the Housing Association made a study of the subject, put forth in this pamphlet, which contains a careful, detailed analysis of the city's housing situation. Among its conclusions are these: that casual observations of unsold houses form a fallacious basis of estimate; and that curtailing construction pending the absorption of present new housing would tend to unstabilize future housing. (Apply to the Director.)

A Plan with Teeth in It.—A 12-page pamphlet by N. G. Slaughter, D.D.S., describing the school dental program that has been carried out in Athens, Ga. Reprinted by the Child Health Demonstration Committee, with additions, from *Hygeia*, December, 1927. The original text is copyright by the American Medical Association. The illustrations add to the interest of this account of a 100 per cent record of dental corrections in the white schools of Athens, and the explanation of how the plan is being maintained. (Apply to the Committee, 370 Seventh Ave., New York.)

The Official Bulletin of Rocky Mount, N. C.—The monthly bulletin is sent out with the city's water, electric light, and gas bills. It is a 4-page, pocket-size folder, with a definite, enlivening message each month from the City Manager, Harrison Gray Otis, or from some one of the municipal departments. The first few issues presented the following reference features: a consolidated sample city balance sheet from an auditor's report; an information and service directory of the city; offer of service from the Health Department; location of fire-alarm boxes; parking rules and hand and arm signals for motorists. (Apply to the City Manager.)

The Present Status of Maternal and Infant Hygiene in the United States.—A 30-page pamphlet by Lee K. Frankel, Ph.D., Second Vice-President, Metropolitan Life Insurance Co., New York, consisting of an address delivered before the Child Hygiene Section of the American Public Health Association in October, 1927. (Apply to Dr. Frankel.)

Mortgage Investments in Queens Borough.—A 34-page booklet issued by the Chamber of Commerce of the Borough of Queens, New York City, telling of the advantages of that borough for building construction and mortgage investments. (Apply to Chamber of Commerce, Long Island City, N. Y.)

How to Organize a Music Week Committee.—A 3-page leaflet of recommendations for individual groups wishing to take the initiative toward the observance of National Music Week, beginning annually the first Sunday in May. (Apply to National Music Week Committee, 45 West 45th Street, New York.)

Tournament of Roses, Pasadena, Calif.—A profusely illustrated booklet, descriptive of Pasadena and the annual tournament. Issued January 1, 1928, by the *Pasadena Star-News*. (Apply to the Star-News.)

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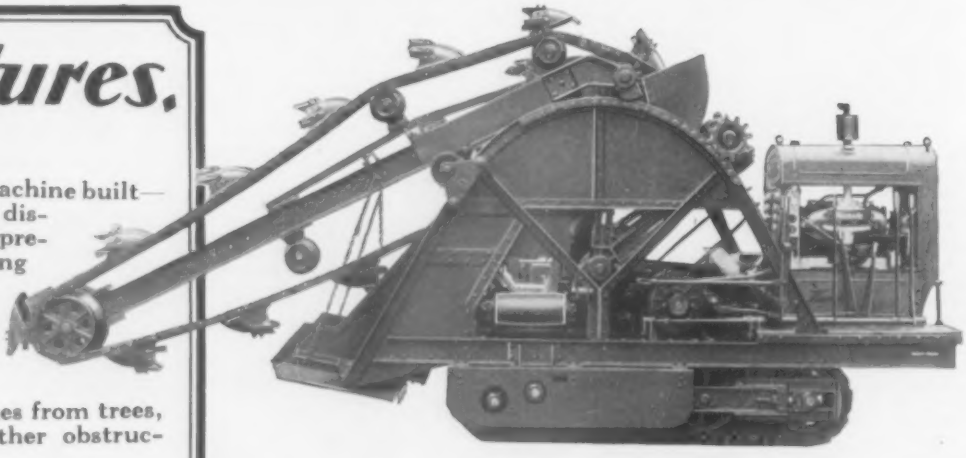

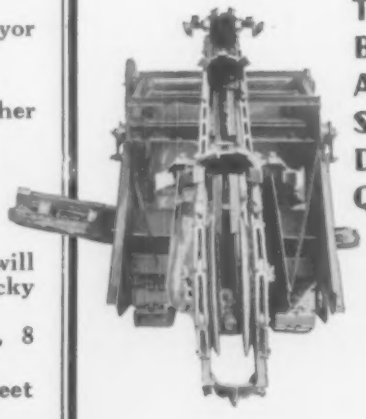

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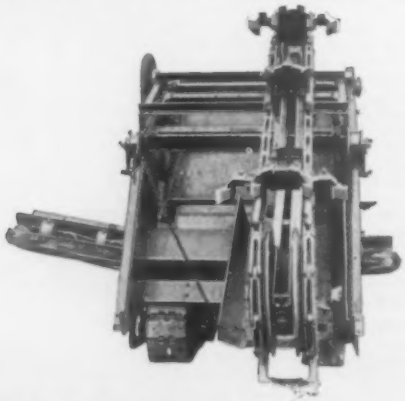

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Los Angeles, Cal., 1947 Mateo St.

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The Life and Work of an English Landscape Architect.—By Thomas H. Mawson, F.L.S. Charles Scribner's Sons, New York. 1927. xvii + 368 pp. $7.50.

This is the autobiography of a landscape architect whose public and private commissions extended not only throughout the British Isles, but into Continental Europe, the Near East and America. Some of the most famous of his gardens are those of the Peace Palace at the Hague, and Queen Alexandra's Danish home. His town planning activities include the re-planning of Athens and Salonica, in Greece; and Regina and Vancouver, in Canada. Intimate glimpses are given of the preparation of many brilliant commissions, and of the contacts with persons of international prominence thereby involved. But perhaps the most interesting part of the work, and the one which will appeal most to workers in this and allied professions, is that devoted to the series of apprenticeships which the author served over many years and in many branches of the subject, keeping always in a direct line of progress to his high goal.

Los Angeles Civic Center Street Plan.—As reported by the Los Angeles Regional Planning Commission, Hugh R. Pomeroy, Secretary, and published in *The Community Builder*, January, 1928, with plans. Available in 8-page reprint form. (Apply to The Community Builder, 827 Union League Building, Los Angeles, Calif.)

The Dyche Stadium, Northwestern University, Evanston, Ill.—A 6-page reprint from *The American Architect*, January 5, 1928, describing the design and construction of this new reinforced concrete and structural steel athletic center, of which James Gamble Rogers is the architect and Gavin Hadden the engineer. The most modern principles of design have been followed in this building, as is illustrated by plans and photographs. (Apply to Gavin Hadden, 607 Fifth Avenue, New York.)

Street Name Signs.—By Adolph J. Post, Senior Assistant Engineer, Public Works Department, Boston; and George H. McCaffrey, Acting Director of Research, Merchants' Association, New York City. An 18-page discussion of best practice in style, size, materials, colors, and locations of street markers. Illustrated. 25 cents. This is Publication Number 8 of the Municipal Administration Service, 261 Broadway, New York.

Some Desirable Goals for Motion Pictures.—By H. Dora Stecker. A paper read at the National Conference of Social Work, Des Moines, May, 1927, in pamphlet form. 10 pp. Described as "a consideration of motion pictures, children, and community life" and containing interesting statistical information including figures to show where movie theaters are located in relation to population centers; children attendance at movies; and a discussion of "What Is Needed." (Apply to the Conference, 277 East Long Street, Columbus, Ohio.)

A Local Venereal Disease Program.—A paper read by Dr. Harry G. Irvine, Division of Venereal Diseases, Minnesota State Board of Health and Associate Professor Dermatology and Syphilis, University of Minnesota Medical School, before the Conference of Illinois Health Officers, Springfield, Ill., and printed in the January issue of *Illinois Health News*. 9 pp., and discussion. (Apply to Illinois State Department of Public Health, Springfield, Ill.)

An Airport for a Large City.—Prize Winners in the Warren Competition, Beaux Arts Institute of Design, with designs ranked first, second, and third by the jury but not eligible for prizes. Five illustrations in the Bulletin of the Institute, January, 1928. (Apply to the Institute, 126 East 75th Street, New York.)

Annexation Map of the City of Los Angeles.—Folded, with covers. Shows the area of the city as increased, during the fiscal year of 1926-1927, with the area of each of the five new additions. (Apply to John C. Shaw, City Engineer, Los Angeles, Calif.)

Architectural Control and Civic Design.—By Carol Aronovici and Rollin L. McNitt, city planning consultants. Two articles reprinted from the *Community Builder*, January, 1928, discussing the theory and practice as well as certain legal aspects of public control of buildings and other structures. (Apply to the magazine, 827 Union League Building, Los Angeles, Calif.)

The Story of Architecture.—By Thomas E. Tallmadge. W. W. Norton and Company, New York. 1927. 312 pp. $3.50.

There has been hitherto no single, comprehensive, non-technical history of architecture in America. Mr. Tallmadge as a Fellow of the American Institute of Architects and master of fluent, poetic prose narrative, has removed the discrepancy most effectually. His "story" becomes in places a delightful commentary upon the social and economic influences asserting themselves in the period under discussion. The few great personalities and the few great buildings upon which our architectural history pivots, assume appropriate historical perspective, at least down to the time of the World's Fair, in Chicago, in 1893. The significance of all that has happened in American building during the past thirty years is matter for many theories. But whether the reader agrees with Mr. Tallmadge or not in his appraisals of present-day architectural trends, he will find them interesting. If he be a municipal official with administrative authority over proposed public buildings, he cannot fail to profit by this eminently readable account of American buildings, public and private, since the earliest days.

The East Side of St. Aldate's.—A proposed plan, with sketches, and a report, prepared by A. S. G. Butler, F.R.I.B.A., in behalf of the Oxford Preservation Trust, and submitted "to the Oxford City Council, the citizens of Oxford, and others to whom the beauty and well-being of Oxford are of concern." The proposal looks to the esthetic and practical enhancement of city-owned property now unused. (Apply to Oxford Preservation Trust, Oxford, England.)

Standard Handbook of Steel Construction.—In 1923, the American Institute of Steel Construction undertook the work of promoting uniform practice in the industry. The committee formed for the purpose, which included prominent figures from academic, engineering, and architectural fields, prepared the Standard Specifications included in this handbook, a substantial volume of 384 pages, bound in limp leather. Other material in the volume consists of the A.I.S.C. Code of Standard Practice and a History of Steel and Iron, together with sections on Properties of Sections, Formulae for Beam Loading, and General Mathematical Tables; The Strength of Materials, etc. $1.50. (Apply to the Institute, 285 Madison Avenue, New York.)

Family and Child Welfare Studies in Pennsylvania, 1921-1926.—By Hugh P. Brinton, Jr. A bibliography compiled through cooperation of the Department of Sociology, University of Pennsylvania, and the Child Welfare Division, Charities Association of Pennsylvania, and published by the Committee on Philanthropic Labor, Philadelphia Yearly Meeting of Friends. 43 pp. (Apply to the Committee, Fifteenth and Race Streets, Philadelphia, Pa.)

Street Trees on Private Property.—A 4-page article in *Landscape Architecture*, January, 1928, accompanied by three pages of excellent photographs, constituting a description by Frederick N. Evans, landscape architect, of Sacramento's method of handling this problem to the great enhancement of the city's attractiveness. 75 cents. (Apply to *Landscape Architecture*, 9 Park Street, Boston, Mass.)

Dust Explosion Codes.—Codes for the prevention of dust explosions in terminal grain elevators and flour and feed mills, adopted as American Standards by the American Engineering Standards Committee. The preparation of the codes was sponsored by the United States Department of Agriculture and the National Fire Protection Association, which worked with a sectional committee of the American Engineering Standards Committee. (Apply to the Committee, 29 West 39th Street, New York.)

A Statistical Analysis of Highway-Railroad Grade-Crossing Accidents in 1926.—Reported by A. B. Fletcher, Consulting Highway Engineer, and William G. Eliot, 3rd, Associate Highway Economist, United States Bureau of Public Roads, in an 11-page article in *Public Roads*, January, 1928. Presented "in the belief that the most intelligent program for grade crossing safety depends upon a thorough knowledge of the existing conditions." 10 cents. (Apply to Government Printing Office, Washington, D. C.)

The Invisible Government.—By William Bennett Munro. The Macmillan Co., New York. 1928. 169 pp. $1.75.

This volume contains the four Jacob H. Schiff Foundation lectures delivered at Cornell University in 1926, and two others, given at Pomona College in 1927. The titles are: Fundamentalism in Politics; The Myth of Popular Sovereignty; The Law of the Pendulum; Government by Propaganda; The Money Power: A Defense; Our Strengthening Sectionalism. The first discusses political catchwords, formulas and slogans and their lack of rationality. The second is built up around the belief that "sooner or later, in all governments, democracy and efficiency obtain a divorce for incompatibility of temper." The other lectures deal with the periodic shifts in the political inclinations of the people; the ways and means of poltical propaganda; the thesis that the direction of government by organized wealth has generally been good rather than bad; and the important influence of regional differences upon national politics.

Proceedings of the Thirtieth Annual Meeting, American Society for Testing Materials.—Held at French Lick, Ind., June, 1927. In two volumes. Part I contains committee reports and 88 tentative standards, new or revised. Part II contains technical papers, with discussions. These contain valuable information on results of investigations by experts in the field of engineering materials, including fatigue of metals, effect of temperature on metals, etc., and a Symposium on Field Control of the Quality of Concrete. Each part, $6.00 in paper, $6.50 in cloth, and $8.00 in half leather. (Apply to the Society, 1315 Spruce Street, Philadelphia, Pa.)

The Reasons Why Urban Municipalities Should Have a Five Per Cent Debt-Incurring Capacity on Full Value.—Municipal Bonding Power, Bulletin No. 27. January, 1928. This 8-page bulletin states the attitude and convictions of the Illinois Municipal League and the Illinois State School Board on this matter, summarizing their reasons under ten headings, the first of which is that the intent of the Illinois state constitution is to allow it. (Apply to the Illinois Municipal League, Urbana, Ill.)

The Reasons for Present-Day Funeral Costs.—By John C. Gebhart, Director, Advisory Committee on Burial Survey. A 40-page summary of facts discovered in an extended national investigation by an impartial board composed of prominent clergymen, physicians, social workers, journalists and funeral directors, made possible through an appropriation of $25,000 by the Metropolitan Life Insurance Co. The burial industry is found culpable; the public almost equally so, but a definite, constructive program of reform may come from within the industry through an already formed organization; and among the recommendations of the Committee is the organization of the public for cooperation with the industry. (Apply to the Committee, 52 Vanderbilt Ave., New York.)

Waste Disposal by Incineration.—"A Memorandum Prepared for the Commissioner of Public Works," by Harrington Place, engineer. Issued in multigraphed, bound form, January, 1928, by the Detroit Bureau of Governmental Research, Inc., as report No. 101. Reviews the history of incineration in that city, also the present disposition of rubbish and other waste matter, with costs, and discusses proposed plans whereby all refuse matter would be reduced to ashes, except reclaimed metals. Contains a list of incineration plants installed since 1920 by a group of the best-known designers, also general material. 50 cents. (Apply to the Bureau, Detroit, Mich.)

Abolish the Death Penalty.—A 32-page handbook issued by the Massachusetts Council for the Abolition of the Death Penalty. Marshals facts, figures, and opinions supporting the view that capital punishment is morally wrong and educationally unsound, and that its abolition is in line with the trend of progress. 10 cents. Apply to the Council, or to *The Arbitrator*, 114 East 31st Street, New York.)

Shall Capital Punishment Be Abolished?—Affirmative argument of Samuel Untermyer in a debate before the Roebling Unit, Steuben Society, Brooklyn, N. Y., January 14, 1928. (Opposition was sustained by Senator William L. Love.) (Apply to League to Abolish Capital Punishment, 104 Fifth Avenue, New York.)

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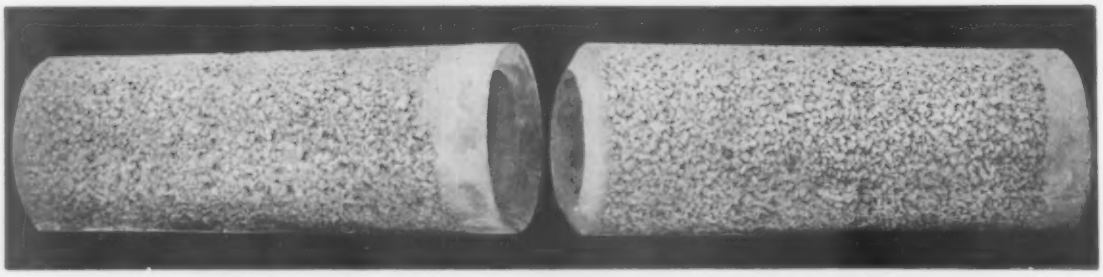

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The Principles of Sanitation.—By C. H. Kibbey, Director of Sanitation, Tennessee Coal, Iron and Railroad Co., etc. F. A. Davis Co., Philadelphia. 1927. 354 pp. $3.50.

Written primarily for sanitary inspectors and other health workers of less than professional status, this book presents in a relatively simple way the causes of the diseases with which public and industrial sanitation deals, and the means of preventing these. An extensive section deals with modern methods of rural sanitation, and there is a chapter each on an analysis of food in its relation to disease, and a study of the prevention of occupational diseases. A two-page bibliography is included. The wealth of information that the book contains is presented in a matter-of-fact manner, and a corollary effort is made to render the non-technical health worker an effective agency of health education.

Salaries of Village Officials in Minnesota.—Three pages of tables in the January, 1928, issue of *Minnesota Municipalities* showing rate and manner of compensation for all officials of this class. 25 cents. (Apply to the League, University Library, Minneapolis, Minn.)

The Torrens System in Cook County, Illinois.—Presented by Joseph F. Haas, Recorder of Deeds and Registrar of Titles, compiled by J. Scott Matthews, Chief Examiner of Titles, and made possible by a publication appropriation made by the Board of County Commissioners. The pamphlet purposes to show benefits derived from registering titles under the Torrens system. Real estate data concerning the county included. 3 cents postage. (Apply to Municipal Reference Library, City Hall, Chicago, Ill.)

Internationale Neue Baukunst.—Grossstadt Architektur.—By Ludwig Hilberseimer. Julius Hoffman, Stuttgart, Germany. 1928. 1927. 55 pp., 5.20 marks; and 106 pp., 9.50 marks, respectively.

These two booklets are Volumes 2 and 3 of the "Baubücher" series, of which "Wie Baut Amerika?" by Richard J. Neutra, was the first. They are paper-bound, of large page size and strikingly illustrated. The first deals with the new architecture, in its international manifestations, and is made up almost entirely of illustrations of industrial, commercial and residential structures, existing or proposed, from America as well as from Germany, France, Holland and other European countries. The second is a textual and illustrated treatment of the architecture of the great city, including consideration of city building and planning, residential, commercial and industrial buildings, skyscrapers, halls and theaters, traffic structures, airports, etc., and the building industry. Both booklets evidence a free imagination, and the desire to develop architectural forms and achievements adapted to modern civilization and expressing its spirit in various ways.

Logansport, Indiana, Gets an Industrial Fund.—The campaign for this achievement, brief accounts of similar achievements in other cities, and ways in which industrial funds are most intelligently spent, are all included in a 10-page pamphlet just issued by The American City Bureau. This joint organization of THE AMERICAN CITY, has for more than 14 years been helping chambers of commerce in financial, membership and operating programs. (Apply to the Bureau, 443 Fourth Avenue, New York City, or 1830 Tribune Tower, Chicago, Ill.)

Reports Received

NEW ORLEANS, LA.—Thirty-first Report, as of August 31, 1927. 56 pp.

HARTFORD, CONN.—Annual Report, Department of Engineering, to March 31, 1927. 46 pp.

FORT WAYNE, IND.—Program of Work of the Chamber of Commerce. 20 pp.

BRADFORD, PA.—First Annual Message of Mayor Spencer DeGrolier, January, 1928. 8 pp. mimeographed.

MONROVIA, CALIF.—Annual Report, Recreation Department, to November 15, 1927. 5 pp.

MILWAUKEE, WIS.—Descriptive booklet, The City Club. 12 pp.

OKLAHOMA CITY, OKLA.—Annual Report, Chamber of Commerce, 1927. 27 pp.

KANSAS CITY, MO.—1927 Report, Public Service Institute. 20 pp.

WILMINGTON, DEL.—Annual Report, Water Department, fiscal year 1926-1927. 56 pp.

BINGHAMTON, N. Y.—Annual Report, Chamber of Commerce, 1927. 17 pp.

BLOOMINGTON, ILL.—Annual Report, Association of Commerce, 1927. 32 pp.

WASHINGTON, D. C.—Annual Report, National Capital Park and Planning Commission. 25 pp.

FALL RIVER, MASS.—Annual Report, Board of Health, 1926. 79 pp.

NEWARK, N. J.—Annual Report, Department of Health, 1926. 314 pp.

DOMINION OF CANADA.—Annual Report of the Minister of Health, as of March 31, 1927. 72 pp. 15 cents.

COLUMBIA, S. C.—Annual Report, Playground and Park Departments, 1927.

CONVENTIONS—WHEN AND WHERE

MARCH 2.—PHILADELPHIA, PA.
The Engineers Club of Philadelphia. A meeting to discuss the Coordination of the Construction and Maintenance of Roads and Streets. Secretary, Chas. E. Billin, 1317 Spruce Street, Philadelphia, Pa.

MARCH 7-9.—LONDON, ONT.
American Water Works Association, Canadian Section. Annual meeting. Secretary, A. U. Sanderson, Island Filtration Plant, Toronto, Ont.

MARCH 8.—CONCORD, N. H.
New Hampshire Goods Roads Association. Annual meeting. Secretary, Frank D. Sleeper, Laconia, N. H.

MARCH 8-10.—LEWISTON, MONT.
American Water Works Association, Montana Section. Annual meeting. Secretary, Herbert B. Foote, Division of Water and Sewage, State Board of Health, Helena, Mont.

MARCH 15-16.—LAFAYETTE, IND.
American Water Works Association, Indiana Section. Annual meeting. Secretary, C. K. Calvert, 1902 North New Jersey Street, Indianapolis, Ind.

MARCH 19-23.—EUGENE, ORE.
Oregon State Secretaries Association. Annual meeting. Address Earl C. Reynolds, President, LaGrande, Ore.

MARCH 23-24.—TRENTON, N. J.
New Jersey Sewage Works Association. Annual meeting. Secretary, John R. Downes, Bound Brook, N. J.

APRIL 17-19.—ATLANTA, GA.
Southeastern Water and Light Association. Annual convention. Secretary, W. F. Stieglitz, Columbia, S. C.

APRIL 19-21.—JACKSONVILLE, FLA.
Florida Engineering Society. Annual meeting. Secretary, J. R. Benton, Gainesville, Fla.

APRIL 24-27.—DETROIT, MICH.
Building Officials' Conference. Annual meeting. Secretary, Fred W. Lumis, Springfield, Mass.

MAY 2-9.—MEMPHIS, TENN.
National Conference of Social Work. Annual conference. Secretary, Howard R. Knight, 277 East Long Street, Columbus, Ohio.

MAY 7-8.—DENTON, TEXAS.
League of Texas Municipalities. Annual convention. Executive Secretary, Harvey W. Draper, 815 Capitol Avenue, Houston, Texas.

MAY 7-10—DALLAS, TEXAS.
National Conference on City Planning. Annual conference. Secretary, Flavel Shurtleff, 130 East 22d Street, New York.

MAY 7-10.—ATLANTIC CITY, N. J.
National Fire Protection Association. Annual meeting. Secretary, Franklin H. Wentworth, 40 Central Street, Boston, Mass.

MAY 7-11.—WASHINGTON, D. C.
Chamber of Commerce of the United States of America. Annual meeting. Secretary, D. A. Skinner, 1615 H Street N. W., Washington, D. C.

MAY 9.—WASHINGTON, D. C.
National Association of Commercial Organization Secretaries. Mid-year meeting. Secretary-Treasurer, A. S. Dudley, Sacramento, Calif.

MAY 22-JULY 10.
American Civic Association. First Annual Traveling Meeting. Secretary, Miss Harlean James, Union Trust Building, Washington, D. C.

JUNE 8-9.—BALTIMORE, MD.
American Association for Promoting Hygiene and Public Baths. Annual meeting. Secretary, Hildegarde M. Rosen, 139 West 96th Street, New York.

JUNE 10-14.—ASHEVILLE, N. C.
Southern Commercial Secretaries Association. Annual convention. Secretary, J. A. Gawthorp, Greensboro, N. C.

JUNE 11-16.—SAN FRANCISCO, CALIF.
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 170 Broadway, New York.

JUNE 13-15.—BRAINERD, MINN.
League of Minnesota Municipalities. Annual convention. Acting Executive Secretary, Harvey Walker, University Library, Minneapolis, Minn.

JUNE 25-28.—COLORADO SPRINGS, COLO.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington Del.

JUNE 26-28.—CORPUS CHRISTI, TEXAS.
Texas Commercial Executives. Annual meeting. Secretary, Maury Hopkins, Plainview, Texas.

JULY 2-7.—PARIS, FRANCE.
International Federation for Housing and Town Planning. Congress. Organizing Secretary, H. Chapman, 25 Bedford Row, London, W. C. 1, England. Chairman, American Committee, Harold S. Buttenheim, 443 Fourth Ave., New York.

JULY 8-21.—EVANSTON, ILL.
National School for Commercial and Trade Organization Executives. Annual session. Address Hugh Lynch, Merchants Association, Woolworth Building, New York.

JULY 29-AUGUST 4.—PALO ALTO, CAL.
Western School for Commercial Secretaries. Annual session. Address Prof. Edward A. Cottrell, Stanford University, Palo Alto, Calif.

AUGUST, LAST WEEK.—SYDNEY, CAPE BRETON, N. S.
Union of Nova Scotia Municipalities. Annual convention. Secretary, Arthur Roberts, K. C., Bridgewater, Nova Scotia.

SEPTEMBER 18-20.—ASHEVILLE, N. C.
International City Managers Association. Annual convention. Executive Secretary, John G. Stutz, Lawrence, Kans.

OCTOBER 1-5.—ATLANTIC CITY, N. J.
Playground and Recreation Association of America. Annual convention. Secretary, H. S. Braucher, 315 Fourth Avenue, New York.

OCTOBER, FIRST TWO WEEKS.—SEVILLE, SPAIN.
International Federation of Local Government Associations (formerly International Congress of Cities). Director, E. Vinck, Rue de la Regence, Brussels, Belgium.

OCTOBER 15-18.—DALLAS, TEXAS.
Southwest Water Works Association. Convention. Secretary, Louis A. Quigley, Ft. Worth, Tex.

OCTOBER 15-19.—CHICAGO, ILL.
American Public Health Association. Annual meeting. Executive Secretary, Homer N. Calver, 370 Seventh Avenue, New York.

OCTOBER 21-24.—NASHVILLE, TENN.
National Association of Commercial Organization Secretaries. Annual convention. Secretary, F. S. Dudley, Sacramento, Calif.

OCTOBER 22-26.—DETROIT, MICH.
American Society for Municipal Improvements. Annual convention. Address: E. A. Wood, City Engineer, Dallas, Texas (Chairman, Convention Arrangements Committee).

OCTOBER 23-26.—NEW ORLEANS, LA.
International Association of Municipal Electricians. Annual convention. Secretary, Harold N. Lang, Orlando, Fla.

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The Mechanical Man closes the discharge

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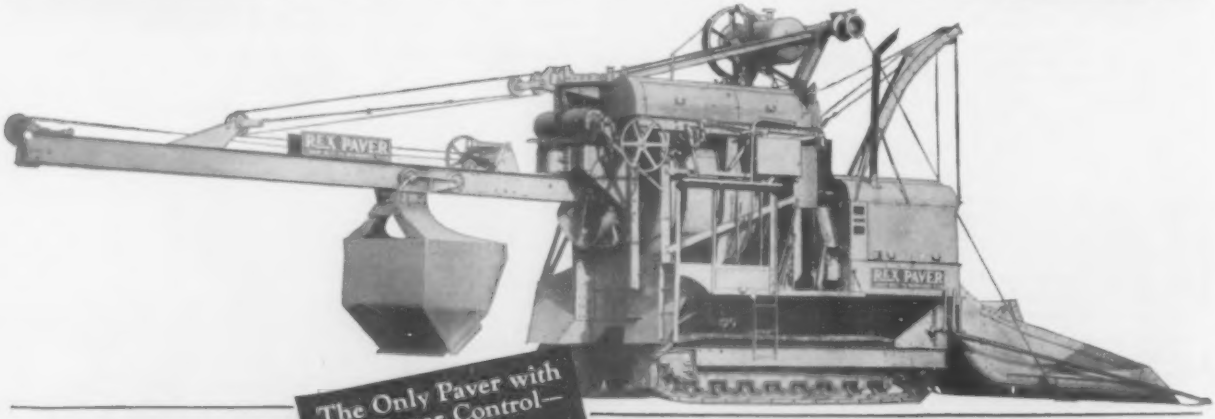

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NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

Steel Tank Sewage Relift Stations

Sewage relift stations which are completely automatic in operation and are equipped with closed impeller type vertical sewage pumps direct-connected to ball-bearing motors and controlled by means of float-operated switches, have been developed by Fairbanks, Morse & Co., Chicago, Ill. Each of these stations contains a small blower which keeps the station ventilated so that it is safe to enter and it keeps the air in the station changed often enough to prevent overheating and sweating of the motors. Each motor is controlled by a separate float switch, and each switch has its own float enclosed in a smooth cast iron float tube. These float tubes are accessible for cleaning and for the adjustment of the float. There is a gate-valve in the discharge line and in the suction line of each pump, so that either pump can be removed for repairs without interfering with the service given by the other pump.

In addition to this, there is a check-valve on the discharge line of each pump, so that either pump can run without interfering with the operation of the other. In this way the float tubes can be set in such a position that one pump will start when the water is three or four feet higher than the level required to start the first pump. Then, if the sewage comes to the first pump faster than it can be handled, the second will cut in and operate in parallel with the first pump.

With this kind of operation, it is highly probable that one pump will do most of the work and receive most of the wear. The wear may be equalized by installing double throw switches which will allow the operation of the two pumps to interchange. These shifts can be made at periods of definite length.

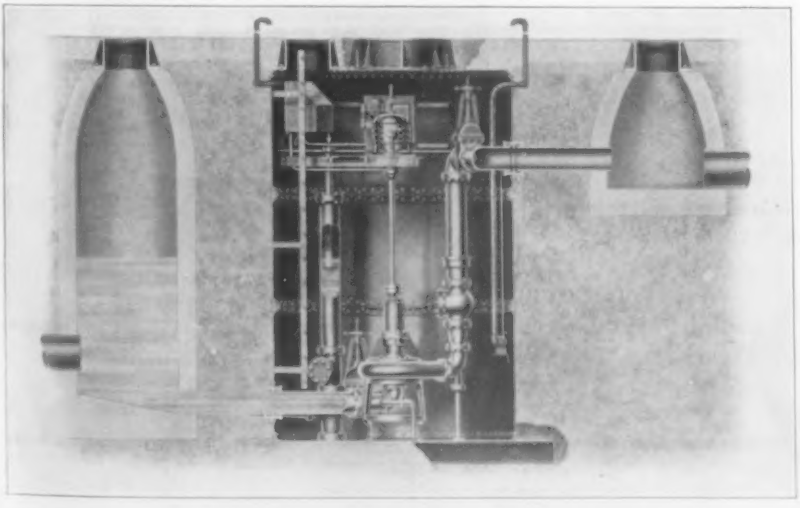
VIEWS OF IMPELLER OF A FAIRBANKS-MORSE SEWAGE PUMP MADE TO PASS ANY MATERIAL THAT WILL PASS THROUGH THE SUCTION LINE

There is a small valve in the suction connection of each pump which is used to keep the tank dry. The draining of the station itself can be accomplished when either pump is running, by opening the small feeder line which leads to the bottom of the tank. The tanks are made water-tight all over, and the manhole covers can be bolted into place in cases where the district in which the station is installed becomes flooded periodically. Each tank is heavily coated inside and out with bitumastic paint to resist corrosion. Each station has I-beams at the bottom with extensions at each end of the I-beams for anchoring the tank against floatation. In soils which are extremely wet, it may be advisable to supplement this with a heavy weight of concrete. This may be poured in the form of a ring around the bottom of the tank, and when this construction is used, a ring of anchor iron is riveted to the outside of the tank.

There is a small manhole just above the ladder and there are two large manholes, one above each pump and motor, for the purpose of removing the machinery when necessary.

Recently, two stations have been installed by the city of Carruthersville, Mo., which were 7 feet 6 inches in diameter and 10 feet 8 inches deep, with each tank containing two 3-inch vertical pumps. Another installation is that of the city of La Junta, Colo., consisting of a single tank 11 feet 6 inches in diameter and 28 feet 7 inches deep, containing two 8-inch vertical sewage pumps and two 40-horse-power motors.

The tank type of relift station has a number of advantages. At the very start the standardized station does away with much of the engineering which is necessary in planning individual installations. Furthermore, there are no costly changes during or after construction due to inexperienced designing. When sewage pumps are used, no straining equipment is required. Thus simplified, the station will often cost for construction and operation less than half what one for the same service with ordinary pumps would cost. All expense for land and buildings is eliminated by the use of underground construction. The entire unit may be installed below the street surface on property already owned by the city, while the conventional design calls for the purchase of the location and erection of a building.



A FAIRBANKS-MORSE STEEL TANK SEWAGE STATION

Dr. Ladd Now Armco Consultant

Dr. George E. Ladd, Economic Geologist, U. S. Bureau of Public Roads, has been appointed consulting geologist by the Armco Culvert Manufacturers Association, and will make his headquarters at Middletown, Ohio. Dr. Ladd's professional career began at the leading universities of America and Europe, and has included positions of the highest distinction. Recognized as a leading engineering geologist, he has within recent years made a special study of landslides and how to control them. By this appointment the services of Dr. Ladd become available to all public and private officials who are confronted with difficult and unusual problems.

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The exploded gossip is that no ditcher can dig through frozen ground

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A Discussion of Gate-Valves

Every water-works system involves the problem of flow control. Synonymously, this involves gate-valves. The effectiveness of the entire system is dependent upon the reliability of the valves. Should the pipe become injured in any manner, the valve must be relied upon to prevent flooding. In the event of fire, valves must be relied upon to make available the water for combating it. If, for any reason, the valve fails to function, immeasurable damage might occur.

Many instances might be cited of such control failure. Most of them have been traced to the use of valve mechanisms designed to obtain inexpensive construction rather than reliability of operation. Before placing a valve in such a position of trust, the design should be carefully investigated.

The general requirements of gate-valves may be briefly stated as follows: (1) Abnormal pressures due to emergency conditions, water-hammer, etc., must be considered by allowing a safety factor of not less than seven in the design of all pressure-resisting parts. (2) All vital parts such as the stems, seat rings and wedge faces or disc face rings, except when handling bronze-attacking substances, must be of bronze or other non-corrodible material to insure proper operation of the valve at all times. (3) The average life of a pipe line is at least 75 years and a valve installed therein should last as long. (4) Valves are often installed and left inoperative for years. They are also installed where conditions require their operation many times daily. The design must insure operation for both conditions. (5) The valve must be capable of positive operation, regardless of the position in which it is installed. Many designs of double disc valves can only be operated with the stem in an upright position.

Gate-valves are conveniently divided into two general classes—rising stem, and non-rising stem. Each of these two classes has its particular advantages as regards purpose and installation. These classes of valves are in turn subdivided into the solid wedge taper seat type and the double disc parallel seat type, each of which has its particular applications. In the solid wedge taper seat, the body seats are placed at an angular relationship with the vertical axis of the body. The included angle between these seats ranges from not less than 10 degrees on valves up to 24 inches in diameter to not less than 7½ degrees on larger sizes. Straight full-way openings do not obtain with this type of valve, because the seat is inherently at an angle. The sinuous motion of the stream passing through the valve is thereby intensified, and excessive loss of head results. The use of pipe cleaning apparatus, tapping machine drills, etc., is also precluded for the same reason.

Double disc parallel seat types involve a body construction with seat faces placed parallel in relation with the vertical axis of the body and at a sufficient distance apart to permit two discs, together with their incidental spreading mechanism, to enter. A full straightway opening is obtainable with this type, permitting the passage of tapping machine drills, etc. The discs being flat and the body seat being parallel, facilitates refacing of the seating surfaces, the double discs with proper wedging mechanisms adjusting themselves to the remodeled condition. Maintenance is thereby greatly facilitated.

Disc-spreading mechanisms are used to force the discs tightly against the body seat when a valve is in closed position. Upon the reliability of this mechanism depends success of double disc parallel seat valve operation. Properly constructed spreading mechanisms will not permit this spreading movement to occur until the discs have reached a position directly opposite the body seat opening, at which moment disc movement parallel to the stem axis will cease and a spreading movement at right angles to the stem axis will take place. Failure to comply with these conditions causes undue abrasive action between the smoothly machined disc and the body seat faces, with the result that they are no longer able to effect a tight seal and leakage occurs. This cycle of movement must occur in reverse order when the valve is opened. That is, the wedging mechanism must release to permit the discs to collapse from the body seat before actual disc movement parallel to the stem axis commences.

In order that no limitations may be placed upon the positions in which a valve may be installed, it is essential that this mechanism be operative irrespective of valve position. Accumulations of dirt, sand and clay carried in suspension in water depositing within the valve, as well as the formations of iron and aluminum oxide, calcium carbonate and magnesium carbonate on the various component parts of the mechanism, must not interfere with its successful operation.

There are two types of spreading mechanisms, namely, the bottom wedging, gravity operated, and the side wedging, mechanically operated, types. The first type has been employed for over half a century. The second has been manufactured since 1896. Both types are now made by valve manufacturers. Attention of valve users has been centered on the bottom wedging type because of its ease of manufacture and inexpensive construction. Such municipalities, however, as New York, Philadelphia, Washington, D. C., St. Louis, Baltimore, and Knoxville, as well as many others where highly organized water departments have thoroughly investigated valve-operating mechanisms with a view to obtaining reliable operation and absence from repairs, have standardized upon the side wedging type.

The side wedging type consists of two cast bronze or cast iron bronze-faced wedges securely fastened to the cast bronze stem yoke and permitted to hang between the discs. In operation, the side pieces are brought into contact with inclines at the sides of the body. These inclines force the wedges inward between the discs, tightly against their seats. When effecting valve closure, the discs are caused to travel in a plane parallel to the axis of the stem until a position directly opposite the body seat is approached. At this point the vertical travel ceases and wedge movement begins. This wedge action is imparted from the sides of the body, and the discs are caused to move in a plane at right angles to the axis of the stem.

When opening the valve, the first movement of the stem screw acts upon the wedges only. The wedges are thereby released and the discs permitted to collapse prior to any vertical movement created upon them by the stem screw. There is no dragging of the seat faces with resultant leakage. The wedges are positively released by mechanical means and no reliance is placed upon the force of gravity alone to secure this end. Valves embodying this wedging principle may be installed in any position whatsoever with positive assurance that the wedging mechanism will function properly.

The material appearing above is taken from the Design and Specification Handbook of the Michigan Valve and Foundry Co., Detroit, Mich., prepared by August Ulbert, Chief Engineer of the company, as a means of informing water-works officials and consulting engineers as completely as possible regarding valves, sluicegates, check-valves and the materials of which they are constructed. This is a generous and helpful contribution to water-works literature.

A Motor Mower to Replace Scythes

A ball-bearing motor-driven mower which can be used in many places where scythes are now used and which will do the work of approximately 30 men, has been developed by the Rawls Manufacturing Co., 202-210 Iowa Avenue, Streator, Ill. This Rawls Type-J ball-bearing motor is pushed about as desired, in a manner similar to a wheelbarrow, and can be tilted to cut up or down slopes. It has a 3-foot cutter bar, 1-horsepower, 4-cycle, air-cooled engine, and weighs when fully equipped only 175 pounds. As it does not occupy much space, it can be easily taken out on a maintenance truck to the district in which it is to be used and left with its operator to cut the roadside weeds or tall grass.

NEW RAWLS ROADSIDE MOWER

Caterpillar Co. Announces Price Reductions

Announcement has been made by the Caterpillar Tractor Co., San Leandro, Calif., of radical price reductions ranging from 8 per cent to over 11 per cent, and representing a cut of $400 in the price of the largest size of the "Caterpillar" tractor to a reduction of $175 in the price of the smallest model, the 2-ton. This company is the successor to the Holt and Best companies, the two pioneers in the manufacture of track-type tractors.

for Economical Transportation

CHEVROLET

Utility Truck with Open Express Body

The World's Lowest Ton-Mile Cost —at Amazing Low Prices!

Whether you need a truck for fast, dependable delivery over city streets . . . whether your problem is the transportation of heavier loads over all types of highways . . . or whether you need a haulage unit for any sort of special purpose—Chevrolet trucks will give you the world's lowest ton-mile cost, plus a type of performance never equalled in a low-priced commercial car!

This matchless economy has been experienced in every line of business and under every condition of usage. You will find that this truck will meet the haulage requirements of *your* business. Thousands of owners have found that no other truck does the job so satisfactorily, at such low cost.

Your Chevrolet dealer can provide a body type designed especially for your business. See him today—and arrange for a trial-load demonstration.

UTILITY TRUCK

$495

(*Chassis Only*)

f. o. b. Flint, Mich.

This price now includes 30 x 5 balloon tires on all four wheels.

Also Light Delivery

$375

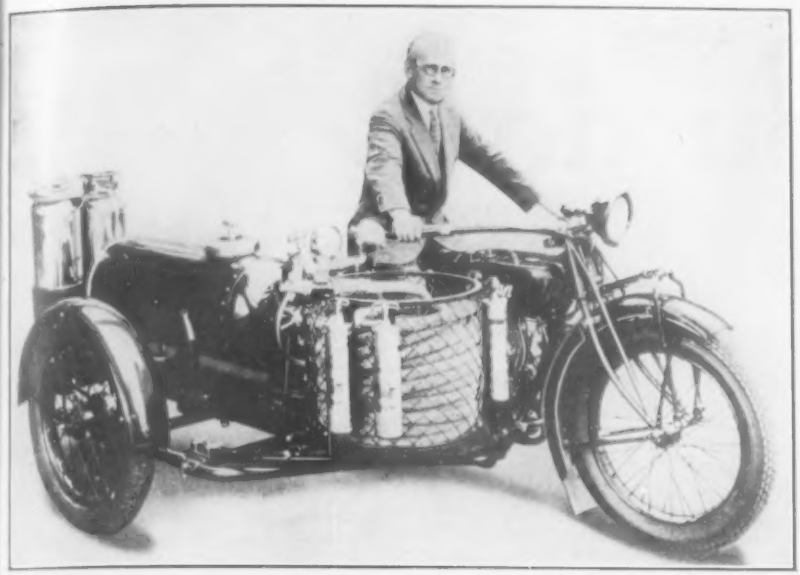
(*Chassis Only*)

f. o. b. Flint, Mich.

CHEVROLET MOTOR COMPANY, DETROIT, MICHIGAN

Division of General Motors Corporation

QUALITY AT LOW COST



THE NEW INDIAN FIRE-FIGHTING UNIT

Smallest Apparatus for Fighting Incipient Fires

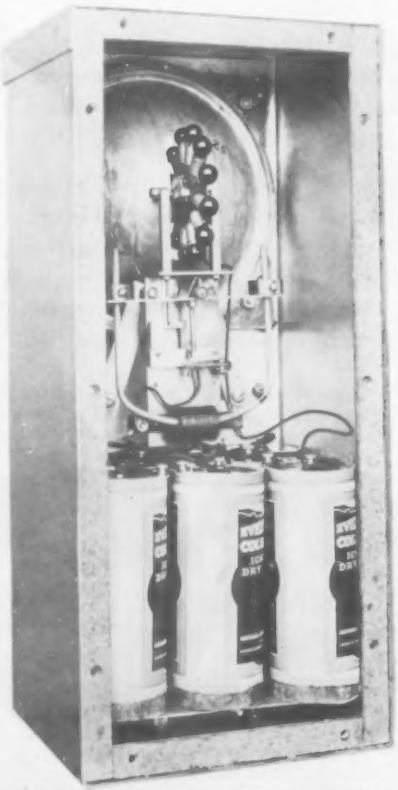
What is reputed to be the world's smallest piece of motor-driven fire apparatus was recently exhibited at the New Jersey State Fire Convention at Atlantic City by the Indian Motocycle Co., of Springfield, Mass. The machine consists of a motorcycle with side-car chassis, the latter having attached a 25-gallon chemical fire extinguisher, a 2½-gallon fire department foam extinguisher and a 2½-gallon soda and acid extinguisher also of the fire department type. These extinguishers are attached to the rear of the chassis. The entire equipment is only 8 feet long and 4 feet wide. The forward section has a wire basket with 100 feet of chemical hose and four 1½-quart carbon tetrachloride extinguishers attached to the outside of the basket. Other equipment carried consists of a regular thick head type axe, two steel brooms for grass and bedding fires, a pike pole for tearing down plaster, and a 4-foot crowbar for a door jimmy.

It is interesting to note that this small fire engine carries a total of 48½ gallons of chemical. A pressure indicator attached to the 25-gallon chemical engine serves to guide the operator at all times as to the quantity of liquid in the tank.

The fire engine, which is driven by a twin-cylinder Indian Big Chief 74 motorcycle, can carry two men. The speed is estimated at approximately 65 miles an hour and it will go from 40 to 50 miles on a gallon of gasoline. The total weight is only ½-ton, as compared with the approximate 7-ton weight of the average motor fire apparatus. Its chief use for fire departments is in extinguishing grass, auto and various other small fires, thereby making a big saving, as such fires do not necessitate the use of expensive and heavy apparatus. They are just the type of conflagrations which must be speedily taken care of, and therein lies another advantage of this small fire engine, as it can dash in and out of congested traffic and arrive at the scene much more quickly than the four-wheeled motor vehicle.

A Dry Battery Flasher for Traffic Signals

It has been demonstrated that a motorist's attention is more quickly attracted by a flashing signal than by a fixed light. In order to furnish a comparatively inexpensive unit which does not rely on electric power lines or cylinders of compressed gas, Wallace & Tiernan Co., Inc., Newark, N. J., has developed a dry battery flasher which uses a group of six or eight 1½-volt dry cells, similar to those used in radio sets.



INSIDE OF DRY BATTERY FLASHER UNIT, SHOWING BATTERIES AND EXTRA BULBS

Through an electrically operated pendulum mechanism, flashes at the rate of 60 per minute are obtained from a miniature incandescent lamp properly focused in a parabolic spreading reflector. Recognizing that these electric lamps will burn out on occasion, and recognizing further that a signal with a burned-out lamp transforms a safeguard into a hazard, a method has been developed to automatically replace a lamp that has gone out of service.

The flashers as installed have at least six months' supply of batteries and one year's supply of lamps. These flashers may be installed as parts of any type of warning signal or beacon with any form of lettering or color desired.

Creosoted Wood Pipe for Outfall Sewers

The use of wood pipe for carrying sewage or drainage water was not economically possible until the commercial development of pressure creosoting as applied to pipe staves. Prior to 1918, when creosoted fir pipe became popular, there had been made several installations of creosoted pipe which were the guides to future theories and methods. The earliest creosoted line consisted of numerous circular culverts installed in 1895 for drainage under and across the main-line tracks of the Southern Pacific Railway Co. in Oregon.

A creosoted stave pipe 12 inches in diameter, erected in 1902 at Everett, Wash., was the first attempt at a treated line under pressure. It was for a long time under constant saturation, but during the last few years has been used only on occasion and has therefore been alternately wet and dry. This condition would have meant the failure of an untreated line, but had no injurious effect on the creosoted wood.

The success of these pipes naturally led to the use of similar pipes for outfall sewers, and the illustrations show two instances where sewer pipes other than wood would have been excessively expensive and structurally difficult. The large pipe is 5 feet in diameter, and the continuous stave type is 1,800 feet in length and constitutes the outfall of the Henderson Street sewer in Seattle. The ground is very treacherous and the bottom very deep. The pipe was installed in 1919 and is now perfectly tight and free from any sign of deterioration. Another pipe of the same kind 30 inches in diameter was later connected with it.

The second illustration shows a 14-inch machine-banded pipe forming part of the outfall sewer on Jersey Street in Seattle. Another Seattle installation is the Hanford Street 30-inch outfall sewer. This passes under the Northern Pacific Railway tracks and under Marginal Way, a wide and heavily traveled street, and into Puget Sound under the Port of Seattle Building. A portion of the Ballard section of Seattle is served by a stretch of 60-inch creosoted wood pipe extending into the Lake Washington Government Ship Canal.

Portland, Ore., has several installations of creosoted wood pipe for outfall sewers, all discharging into the Willamette River.

Will you do it—★★★★—?

No line of equipment has ever held commercial supremacy whose sales have resulted from high pressure "word-selling." Products of leadership are invariably those in which the highest ideals of commercial value have been embodied in the forms of superior mechanical development—careful and painstaking workmanship—the employment of the best in material—and the constant supervision of the builder to develop and achieve the maximum in operating efficiency.

— * * * — ***Users of "street flushers—street sprinklers—road oilers" are asked to make every comparison with the TECO line of equipment.***

The high operating efficiency of TECO equipments is not due to any one feature *but a combination of many* and the correctness of their correlated design—all of which is the result of *engineering talent* of men whose ideas and finished units are known to thousands of municipal executives as equipments of proved service, long life, dependability and economy.

We suggest you ask for our latest bulletins. Our engineering department will gladly cooperate with you in designing special equipment.

TECO

Street Flushers / Street Sprinklers / Road Oilers / Special Equipment

TRUCK EQUIPMENT CORPORATION / / JOLIET, ILLINOIS

THE HENDERSON STREET CREOSOTED WOOD PIPE OUTFALL SEWER IN SEATTLE, WASH.

They are supported between piles, constructed in the air, and lowered into place in the water. There are five of them, ranging in size from 78 inches to 48 inches, and they have been in service from twelve to fourteen years. Recent inspection reports them in excellent condition.

In 1917 the city of Los Angeles, Calif., installed 1,955 feet of 52-inch outfall sewer at Hyperion. This was built out over the Pacific Ocean suspended from piles.

The city of Montesano, Wash., is now preparing to install 2,700 feet of 24-inch outfall sewer.

All the pipes mentioned are of Douglas fir creosoted by the vacuum and pressure process. In January, 1922, the American Wood Preservers Association adopted specifications covering the creosoting of staves for wood pipe. Eight pounds of creosote per cubic foot of wood is generally used and this amount is found ample.

The use of creosoted Douglas fir wood pipe is increasing on account of the following reasons, according to the Federal Pipe and Tank Co., 24th Avenue, N.W., Seattle, Wash.:

1 It is flexible; the movement of soft ground will not injure it.
2. It may readily be supported on, between, or suspended from piles or cross-timbers.
3. It may be subjected to high pressure in crossing depressions or in pumping operations.
4 It can be erected rapidly and if necessary taken apart and rebuilt.
5 It does not have to set or dry out, but is ready for use as soon as constructed.
6 It is made of separate units, each of which may be thoroughly inspected before being used.
7 It is long-lived and economical.

THE JERSEY STREET SEWER IN SEATTLE, WASH., RECONSTRUCTED WITH 14-INCH CREOSOTED WOOD STAVE PIPE

THE NEW LITTLEFORD TRAFFIC LINE MARKER

A Traffic Line Marker

A traffic marker that the manufacturers have named the "Traf-O-Mark" and can be used for marking streets, highways, athletic fields, or parking spaces, has been developed by Littleford Bros., 500 East Pearl Street, Cincinnati, Ohio. It uses 4 to 5 gallons of paint to the mile when making a 4-inch line. According to the manufacturers, it will pay for itself within 20 or 25 miles of operation.

The marker is so constructed that a man operating it can see directly in front of the marking roller. The handles can be adjusted so that he can either straddle the marked line or walk on one side of it. It is easy to follow a straight line with the marker. In front of and geared to the marking roller, is a brush which cleans the surface of the road or street where paint is to be applied. When approaching a curb, the brush may be disengaged and thrown back to permit the marking roller to come close to the curb.

The supply tank holds five gallons of paint. The paint is fed to the marking roller by means of a small automatic pump which regulates the flow of paint to the speed of the marker. It is self-adjusting and fool-proof. The roller receives the right amount of paint at all times.

The marking roller has a sponge rubber cushion that grips the surface of the road. The sponge rubber is protected from the paint by an absorbent canvas cover. This cover provides a firmness which prevents the line on the road from bleeding. The roller, properly fed by the automatic pump, marks a sharp, even line. Any make of traffic paint can be used, providing the consistency is not changed. The marking roller is made in three widths—4-, 5- and 6-inch, and they are interchangeable.

Gill with Griffenhagen and Associates

Earle Gill is now associated with Griffenhagen and Associates, Ltd., Bureau of Public Service, 155 East Superior Street, Chicago, Ill., and Mills Building, Washington, D. C. This organization is engaged in the field of municipal administration and finance, offering a service in the revision, codification and indexing of municipal ordinances.

Again...LOWER PRICES

PRICES on Snow Special, Logging Cruiser and other special models bear similar reductions . . . . . .

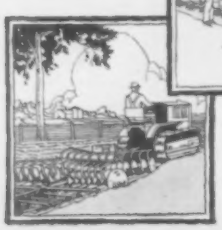
for "Caterpillar" Tractors

. . . again the Caterpillar Tractor Co. passes on to purchasers the benefits of increased sales and consequent production economies. . . . Again it announces reductions in the prices of all sizes of the "Caterpillar" Tractor.

NEW REDUCED PRICES

Effective January 27, 1928

SIXTY	THIRTY	TWENTY	2-TON
$4600	**$2650**	**$2175**	**$1675**
F. O. B. Peoria or San Leandro	F. O. B. Peoria or San Leandro	F. O. B. Peoria or San Leandro	F. O. B. Peoria



There is a "Caterpillar" Dealer near you.

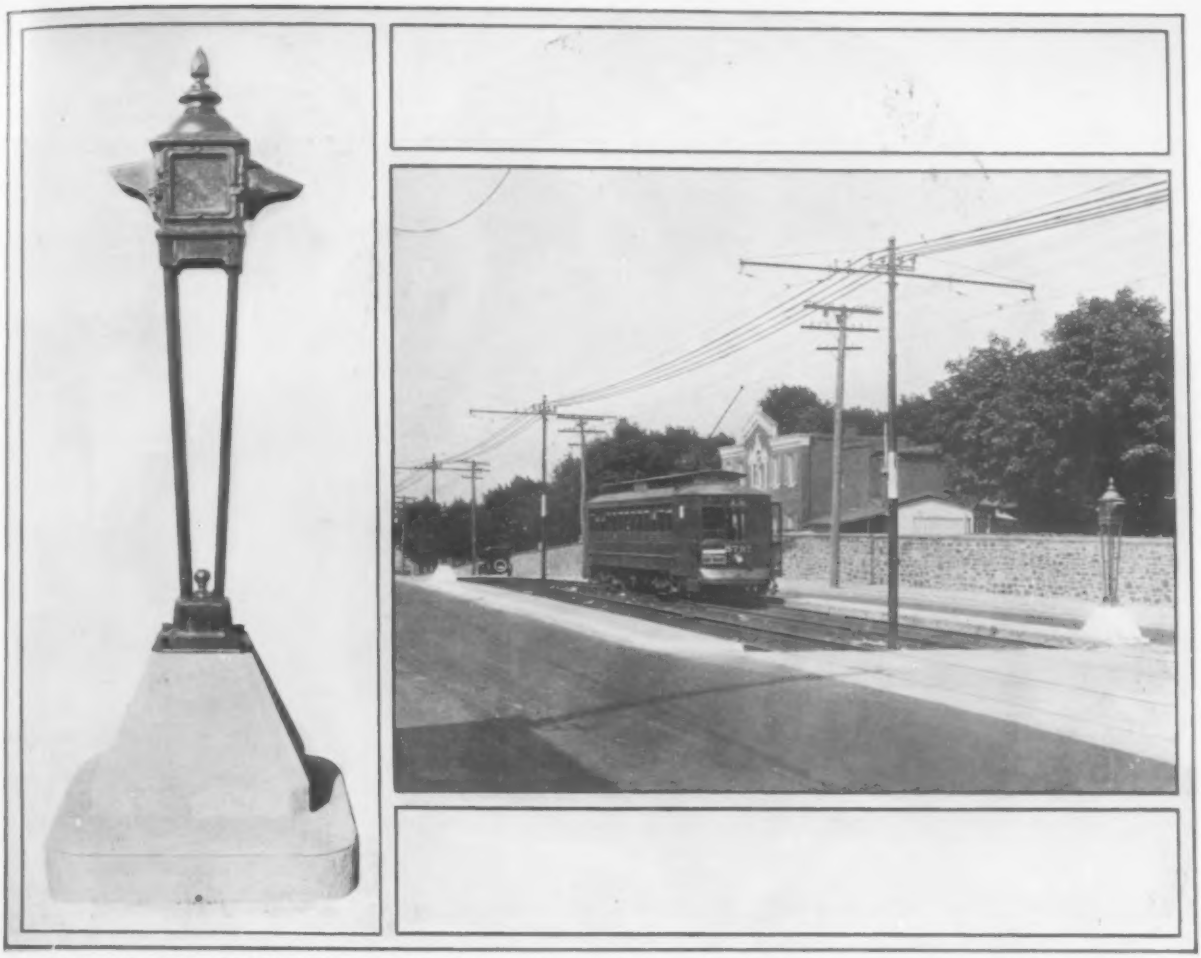
CATERPILLAR TRACTOR CO.

Executive Offices: San Leandro, California, U. S. A.
Sales Offices and Factories:
Peoria, Illinois San Leandro, California
Distributing Warehouse: Albany, N. Y.
New York Office: 50 Church Street

Successor to

BEST — C. L. Best Tractor Co. — The Holt Manufacturing Company — HOLT

CATERPILLAR
REG. U.S. PAT. OFF.



GENERAL ELECTRIC FLASHING BEACON, AND INSTALLATION AT TROLLEY LOADING PLATFORM IN BALTIMORE, MD.

Hair-Drying Facilities for Swimming Pools

Adequate and satisfactory hair-drying facilities should be part of the equipment of every well-regulated swimming pool or public bathing pavilion. Such equipment should preferably be of the electrically operated type which can be attached to a lighting circuit, to consume little electricity and to provide quick and adequate service.

It is perhaps needless to say that the dryer itself should be durably constructed in order to successfully withstand the rough usage it is bound to receive in a public place. The equipment must be practically foolproof and so built as to be able to prevent tampering. It should preferably be attached to the wall permanently in order to save all available floor space.

Keeping the patrons' hair dry is a direct responsibility of the municipality operating the pool, as it protects the patrons against the bad effects from going out into the air with wet hair. It also makes available the pool facilities to many who have not used them heretofore because of the difficulty of drying the hair where suitable hair dryers are not provided.

An effective electrically operated hair dryer for installation in the dressing-rooms of swimming pools, and here illustrated, has been developed by the Chicago Hardware Foundry Co., North Chicago, Ill.

A COMPACT ELECTRIC HAIR-DRYING UNIT FOR SWIMMING POOLS

New Flashing Beacons for Trolley Loading Platforms

To safeguard pedestrians in traffic, the city of Baltimore has installed 130 flashing beacons on various loading platforms along its trolley lines. These beacons not only illuminate the platform itself, but also flash a light to warn motorists to drive carefully.

The beacons, made by the General Electric Co., Schenectady, N. Y., are on three sides of each unit, identical with the standard beacon having a square condensing lens optical system. On the fourth side there is a 15-degree downward offset optical door of the reflector type for flood lighting. The three square-door units flash an amber light which warns approaching motorists of the proximity of the loading platform. The 15-degree optical unit gives a steady white light which floods the entire loading platform, thus safeguarding the trolley patrons. Another floodlight in the bottom of the signal lights up the base of the unit. It is this threefold illumination that makes the beacon a desirable part of the traffic-signal system of any city of considerable size.

District Managers Hold Meeting

At a four-day meeting of the District Managers of the Pittsburgh Equitable Meter Co., Pittsburgh, Pa., many interesting views were expressed regarding the improvements in design and construction, as well as the development of several new products in the gas and water divisions of the company, according to a report recently received.

The Mark of Quality

"Our Fire Truck has been equipped with the same set of Firestone Gum-Dipped Tires for more than two years, and this is to advise you that they have given uninterrupted service.

We are well pleased with the performance of these tires and would not hesitate to recommend Firestone Tires where lives and property are at stake."

Yours very truly,
W. Giddens, Chief,
Perry Fire Department,
Perry, Fla.

Recommended by Fire Departments Throughout the Country

The need for utmost tire safety under all conditions—for trouble-free, on-the-minute performance—has brought Firestone Gum-Dipped Tires into fire fighting work in practically every section of the United States.

Gum-Dipping gives Firestone tires special qualities—saturating and insulating the cords of the carcass with rubber and protecting them from high-speed heat, friction and wear. The Firestone safety tread provides rows of non-skid studs, scientifically designed and arranged to resist slip or skid in any direction.

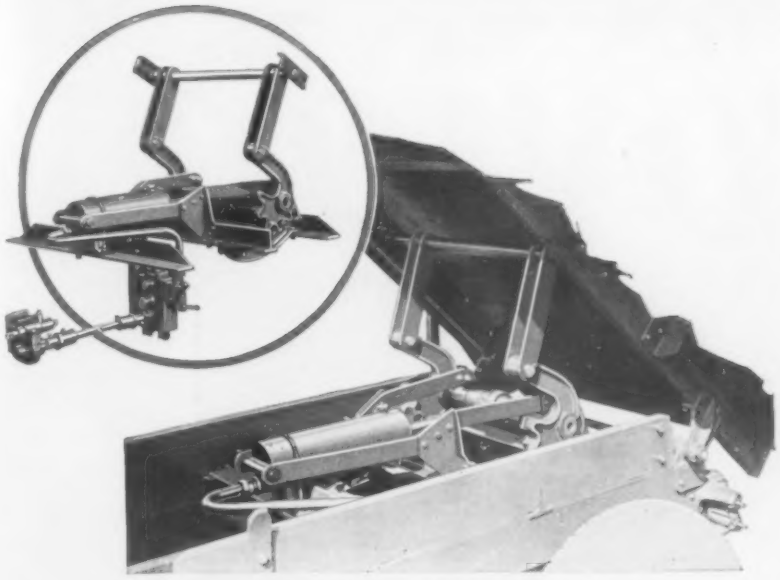
You can take advantage of these fire fighting aids by calling on your local Firestone Dealer. With his knowledge of tires and his quick service always available, you can be sure that your apparatus *is prepared* for any emergency that arises.

MOST MILES PER DOLLAR

Firestone

GUM-DIPPED TIRES

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER.. Harvey S. Firestone



THE NEW WOOD HI-SPEED UNDERBODY HYDRAULIC HOIST

A Fast New Hydraulic Hoist

Designed particularly for short wheelbase, light, speedy, pneumatic-tired trucks with close-coupled chassis, the new G-1, Hi-Speed underbody hydraulic hoist has been developed by the Wood Hydraulic Hoist & Body Co., Detroit, Mich. This new hoist is capable of dumping the load in less than five seconds, and elevates the body to an angle of 60 degrees.

Contractors, road builders, supply dealers, and highway maintenance, garbage and snow-removal departments, which need power-operated equipment for the short wheelbase chassis of the roadbuilder 1-ton and 1½-ton types and require speed as the first essential, will be interested in the appearance of this hoist on the market. The hoist is easily installed and simple to operate. Employing the hydraulic principle, it derives its power from the truck transmission. It is light, yet has all the advantages of a heavier unit. It is compact, flexible and convenient in the most congested places.

The hoist can be mounted on a chassis with the loading space behind the cab of 45 to 80 inches, and has a total weight of only 375 pounds. It will operate efficiently under the most severe conditions.

Changes in Allis-Chalmers Offices

The Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has opened a new district sales office at Phoenix, Ariz., to cover Arizona, New Mexico and the northern part of the republic of Mexico. The office is located at 308 Heard Building, with J. B. Cooper as Manager. Mr. Cooper was formerly at Los Angeles.

A branch office has been opened at San Antonio, Texas, at 619 Frost National Bank Building, with Earle R. Hury in charge. This is a branch of the district office at Dallas.

A branch office is also being opened at Grand Rapids, Mich., in the Weiss Service Building, with G. C. Culver in charge. This is a branch of the Detroit district office.

A New 10-Ton Tandem Roller

With the increasing demand for more compression on asphalt pavements and also for motor-driven tandem rollers to replace steam tandem rollers, the Galion Iron Works and Manufacturing Co., Galion, Ohio, has developed and announces a 10-ton, heavy-duty tandem motor roller which has a three-section steering roll.

This new roller is powered by a Hercules Model-G motor. The power steering is operated by the same motor, and a special transmission, designed and produced in the Galion plant, meets the special requirements of tandem service on asphalt. The important considerations in this work are smooth operation and quick, positive reversing. Jerky operation or allowing the roller to stand still more than an instant is bound to result in an uneven asphalt surface. Reversing instantly and smoothly without a gear shift is possible with the new Galion roller. Thorough tests on asphalt work under the strictest requirements have shown that this roller meets the requirements, according to the manufacturer.

In its new line of motor tandems, in which the 10-ton heavy-duty tandem is the latest, the Galion Iron Works and Manufacturing Co. claims to have attained fully all the advantages of the steam tandem without the disadvantages of having to supply fuel, of frequent firing, and of the smoke annoyance. This roller completes the Galion line of motor tandems, which now consists of 10-, 9-, 8-, 7-, 6-, and 5-ton sizes. The Galion line also includes steam tandems in the same sizes.

A Gasoline Concrete Breaker That Is Self-contained

A new labor-saving device in the form of a gasoline hammer made for breaking up concrete and asphalt paving, has been developed by the Milwaukee Gas Tool Corporation, Milwaukee, Wis. The machines have been in tests on the job for two years, working under the most severe conditions. This machine is known as the Rodax. It is a gasoline hammer which has no flywheel, connecting rods, camshaft or bearing. The piston operates as the hammer, striking more than 1,000 blows a minute. These blows are transmitted through an anvil direct to any standard cutting tool that may be used.

THE RODAX, A SELF-CONTAINED PAVEMENT BREAKER

The entire unit weighs but 85 pounds, and will operate all day on 2 gallons of gasoline. It requires no outside equipment to operate it, and it is a self-contained unit.

The machine will be marketed by the Milwaukee Gas Tool Corporation, Milwaukee, Wis., through contractors' equipment distributors, and manufactured by the LeRoi Company.

THE NEW 10-TON GALION TANDEM ROLLER

provide

This 9 ft. Armco drain in service since 1910
—still in perfect condition

safe, large drains of ARMCO flexible design

IF YOU are a public official in charge of drainage systems, you know the vital importance to your community of safe underground construction. Safety brings freedom from depreciated property values and endangered health. The larger the drain, the more serious are the consequences of failure, and the more important becomes its design.

There is awaiting those who have previously used massive construction a revelation in the greater safety of the flexible type. Since 1896 the corrugated iron drain, in the largest diameters, has been proving to public officials that it cannot crack and cannot be crushed by ordinary subsoil pressures. Upon the introduction of Armco ingot iron in 1906, it established in addition a new standard of durability.

The benefits of correct drainage are far reaching and invaluable. They are available to you in pipe of the dependable, flexible design and long-lasting pure iron. Protect your city with safe, economical Armco drainage.

Forty manufacturing plants throughout the United States and Canada assure you immediate service on drainage requirements, no matter where you may be.

ARMCO CULVERT MANUFACTURERS' ASSOCIATION
MIDDLETOWN, OHIO

ARMCO PIPE

Flexibility for safety and economy in underground construction

©1928, Armco Culvert Mfrs. Assn., Middletown, Ohio

THE AMERICAN-MARSH PORTABLE CENTRIFUGAL PUMP, EQUIPPED WITH AUTOMATIC PRIMER

An Automatic Primer for Portable Pumps

The automatic primer which has been developed by the American Steam Pump Co., Battle Creek, Mich., for use on the Barton pump, is one of the most valuable improvements of interest to contractors, as it permits the use of a centrifugal pump for pumping small quantities of water where under ordinary conditions the prime would be lost quite frequently. Where the pump is removing seepage from manholes or other excavation, the flap-valve on the delivery line can be closed down to make delivery approximately correspond with the amount of water reaching the intake. The use of the automatic primer makes it possible to pump seepage water and keep the hole dry without an operator as long as the engine runs. When pumping is intermittent, the action of the gravity flap-valve in conjunction with the automatic primer insures continuous priming and the operation of the pump without supervision. When not in operation, both the pump and the primer are thoroughly drained.

The operating mechanism consists primarily of the gravity flap-valves on the discharge and a line from the automatic primer to the intake manifold of the engine. As soon as the engine is started, the pump is primed by the air being removed from the suction line through the intake manifold. As soon as water reaches the cork float in the primer, it is lifted and immediately shuts off the line to the intake manifold of the engine, thus preventing any water from reaching the engine. The instant the prime is lost, the float drops, suction to the intake manifold immediately takes place and continues until the water reaches the cork float.

The Barton pump, which is well known for the ease with which it may be attached to the crankshaft of a motor truck or automobile and used to pump out trenches, excavations, cellars, etc., is one of the units of the new American-Marsh portable pumps, which are built in several sizes and powered with a LeRoi 2- or 4-cylinder engine, depending on the size of the pump.

A New Sand Spreader

A sand spreader that is designed for the purpose of spreading sand, salt, or ground cinders on highways or city streets when these are rendered unsafe by ice or snow, has been placed on the market by The Good Roads Machinery Co., Inc., Kennett Square, Pa. This spreader is built as an independent unit, so that it may be placed within the body of a truck and temporarily secured thereto or placed directly on the truck chassis. It consists of a steel hopper, screw conveyor, spinner disc, gasoline engine, drive gears, shafting and bearings, all mounted on channels as a single unit.

The device is made with two speeds of the conveyor, so as to vary the quantity of sand delivered to the spinner, and consequently to the road surface. The amount of sand delivered to the road also depends on the speed at which the truck is being operated. With the high speed on the conveyor and low speed on the truck, very much more sand will be delivered to the road than if the low speed is used for the conveyor and a high speed on the truck. Several combinations of speed can be obtained, all of which will vary the amount of sand delivered, thus making the machine applicable to varying conditions.

The spreader is built with a separate motor unit so that it is independent of the truck power, and may readily be removed therefrom or changed to another truck without any changes except that of securing it to the body or chassis on which it is to be used.

Normally, the spreader will throw the sand over a 9-foot width of space. To accomplish the best work, the spinner should be adjusted so as to be about 14 inches from the road, at which height the best results have been achieved. The body or bin of the machine will hold approximately 6 cubic yards of sand, and this, under normal conditions, will spread about 3 miles of sand 9 feet wide. A steam jacket is provided around the conveyor trough to prevent the mass from freezing solid in very cold weather, and the exhaust from the operating truck may be connected up with the steam jacket, furnishing constant heat while the truck is in operation.

The whole unit is self-contained and is intended to be mounted in a truck body or directly on a chassis frame. It is sturdily built, its operation is simple, all shafting is mounted in anti-friction bearings and all drives are by means of sprockets and chain, except the spinner drive, which is a spiral bevel gear, heat-treated and hardened.

THE GOOD ROADS SAND SPREADER, MOUNTED ON A WALTER SNOW FIGHTER TRUCK

Draney with Natural Rock Asphalt Corporation

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President of Kennedy Valve Mfg. Co. Dies

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Asphalt Paving Technologists Hold Annual Meeting

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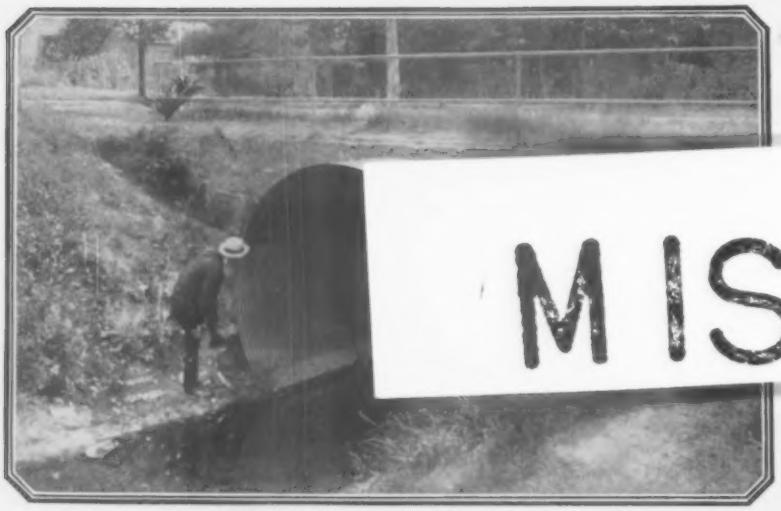
provide



This 9 ft. Armco drain in service since 1910
—still in perfect condition

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safe, large drains *of Armco flexible design*

IF YOU are a public official in charge of drainage systems, you know the vital importance to your community of safe underground construction. Safety brings freedom from depreciated property values and endangered health. The larger the drain, the more serious are the consequences of failure, and the more important becomes its design.

There is awaiting those who have previously used massive construction a revelation in the greater safety of the flexible type. Since 1896 the corrugated iron drain, in the largest diameters, has been proving to public officials that it cannot crack and cannot be crushed by ordinary subsoil pressures. Upon the introduction of Armco ingot iron in 1906, it established in addition a new standard of durability.

The benefits of correct drainage are far reaching and invaluable. They are available to you in pipe of the dependable, flexible design and long-lasting pure iron. Protect your city with safe, economical Armco drainage.

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MIDDLETOWN, OHIO

ARMCO PIPE

Flexibility for safety and economy in underground construction

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THE AMERICAN-MARSH PORTABLE CENTRIFUGAL PUMP, EQUIPPED WITH AUTO-

UMBERED

as it permits the use of a centrifugal pump for pumping small quantities of water where under ordinary conditions the prime would be lost quite frequently. Where the pump is removing seepage from manholes or other excavation, the flap-valve on the delivery line can be closed down to make delivery approximately correspond with the amount of water reaching the intake. The use of the automatic primer makes it possible to pump seepage water and keep the hole dry without an operator as long as the engine runs. When pumping is intermittent, the action of the gravity flap-valve in conjunction with the automatic primer insures continuous priming and the operation of the pump without supervision. When not in operation, both the pump and the primer are thoroughly drained.

The operating mechanism consists primarily of the gravity flap-valves on the discharge and a line from the automatic primer to the intake manifold of the engine. As soon as the engine is started, the pump is primed by the air being removed from the suction line through the intake manifold. As soon as water reaches the cork float in the primer, it is lifted and immediately shuts off the line to the intake manifold of the engine, thus preventing any water from reaching the engine. The instant the prime is lost, the float drops, suction to the intake manifold immediately takes place and continues until the water reaches the cork float.

The Barton pump, which is well known for the ease with which it may be attached to the crankshaft of a motor truck or automobile and used to pump out trenches, excavations, cellars, etc., is one of the units of the new American-Marsh portable pumps, which are built in several sizes and powered with a LeRoi 2- or 4-cylinder engine, depending on the size of the pump.

A New Sand Spreader

A sand spreader that is designed for the purpose of spreading sand, salt, or ground cinders on highways or city streets when these are rendered unsafe by ice or snow, has been placed on the market by The Good Roads Machinery Co., Inc., Kennett Square, Pa. This spreader is built as an independent unit, so that it may be placed within the body of a truck and temporarily secured thereto or placed directly on the truck chassis. It consists of a steel hopper, screw conveyor, spinner disc, gasoline engine, drive gears, shafting and bearings, all mounted on channels as a single unit.

The device is made with two speeds of the conveyor, so as to vary the quantity of sand delivered to the spinner, and consequently to the road surface. The amount of sand delivered to the road also depends

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THE GOOD ROADS SAND SPREADER, MOUNTED ON A WALTER SNOW FIGHTER TRUCK

motor unit so that it is independent of the truck power, and may readily be removed therefrom or changed to another truck without any changes except that of securing it to the body or chassis on which it is to be used.

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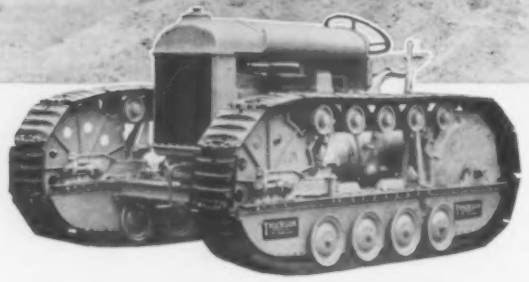
Utility—Economy—Dependability



UTILITY—Because of their general all-around usefulness and advantages, combined with their satisfactory performance, Trackson-Fordsons have won their place in every field of activity where traction, power and speed are demanded.

ECONOMY—Because they are low in first cost, and their maintenance and operation is surprisingly cheap. A Trackson-Fordson has the pulling power of four big horses at twice their speed and will work in places where animals and wheel tractors cannot secure traction.

DEPENDABILITY insures work being done efficiently, quickly and economically. Delays mean larger costs or less profits. Ceaseless, tireless, and built to withstand rough usage, Trackson-Fordsons work hour after hour, day in and day out regardless of weather or ground conditions, rendering an indefinite period of faithful, constant, satisfactory service.

Utility — Economy — Dependability — that's what you should demand of your equipment, and that is just what Trackson-Fordsons are delivering to their owners the world over. Write today for complete information.

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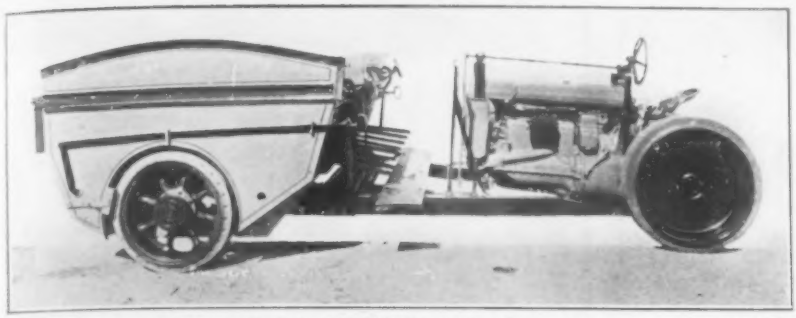

"BIG SANDY," A MACHINE FOR SPREADING SAND OR GRAVEL TO ANY DESIRED THICKNESS ON ROADS

A Motorized Distributor for Sand and Gravel

A new mechanical distributor which will apply from 1 to 2½ inches of material to the road surface evenly, has been developed by the Highway Products Co., 11 North 6th Street, New Bedford, Mass. This distributor, known as "Big Sandy," spreads material ahead of its front wheels. It can be loaded at the point of work, and screening of the aggregate is unnecessary, regardless of the required fineness of cover. The various depths and widths of material are accurately controlled. This machine, which is illustrated, is adaptable for covering tar and asphalt resurfacing work, covering penetration and seal coat work, shoulder maintenance, applying 1 to 2½ inches of gravel for maintaining road surfaces, spreading metal on gravel roads, dusting an oiled surface during hot weather, sanding under winter conditions, and distributing calcium chloride.

The machine is driven by a Fordson tractor, the steering wheels being the driving wheels, thus permitting the movement of heavy loads in close quarters. The approximate weight of the machine is 10,000 pounds. The slide-plate control handles are equipped with spring-lock connections by which several positions of the plates are obtained, this being important in handling wet or extremely dry materials.

Aggregate up to 6 inches in diameter can be passed through the machine. The machine is loaded by simply dumping a motor-truck load of material into it, thus saving the delay necessary in leaving the job for material. By the use of the machine in New Bedford, Mass., three men are now doing the covering work of twenty, thus saving considerable aggregate because of the consistently even application.

A Trough for Use Over Impassable Roads

A practical solution for moving traffic over impassable roads has been found in Metalrut, a light, portable curved trough of heavy-gage corrugated metal, made by the Metalrut Co., 3-23 West Water Street, St. Paul, Minn. State highway departments are able to move traffic and haul materials economically and quickly with the use of this equipment.

These troughs, integrally reinforced with rolled edges, are held in a parallel position by corrugated struts. They are built in 10-foot sections for easy handling, stacking and laying. After leveling off muck or sand so that each trough has a good bearing for its full length, the sections are lapped two corrugations and bolted together, and a continuous track is formed. For continuous use by trucks, Standard Metalrut for light trucks only is recommended. Heavy-duty Metalrut is available for heavier loads.

The hauling of material is greatly facilitated over any new fill, loose soil, or subgrade and difficult wheels are eliminated when this metal trough is used. It makes possible the hauling and moving of traffic through mud holes, frost holes, washouts, snow-drifts, sand-drifts, and other emergency road conditions where otherwise traffic would be at a standstill.

METALRUTS CARRYING TRAFFIC OVER A MUDHOLE

H. P. Jones & Co. Expands

H. P. Jones & Co., engineers, 1602 Second National Bank Building, Toledo, Ohio, announce the expansion of their organization and extension of facilities to handle all types of municipal engineering problems and will continue to specialize on the following: fuel analyses; fuel application; gas distribution; gas plant design; inspection of materials; plant operation; process development; referee analyses; sewage treatment; sewerage; waste utilizations; water-supply; and wood preservation.

The following engineers are associated with the firm members: R. M. Batch, M. W. Chappell, B. F. Darling, H. F. Darling, J. H. Dodge, T. B. Henry, R. D. Hoyt, J. H. Jewhurst, E. C. Manahan, E. C. Mathis, D. J. McGraw, P. J. O'Connor, E. I. Roberts, G. N. Schoonmaker, H. A. Stepleton, and R. S. Wenner.

A BARBER-GREENE SNOW LOADER AT WORK IN VIENNA

These modern machines for cleaning the snow from the streets are known as "snow eaters" in Vienna, Austria. The equipment is mounted on crawler treads, and the snow is loaded direct into the trucks at the rate of a ton a minute

pump it DRY
keep it DRY

EXPERIENCED contractors know that Barnes Pumps—made for every drainage need—can be depended upon to pump their excavations dry and keep them dry.

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Capacity duplex pump 20 to 24,000 g. p. h.

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Francis Bacon
1625